

16091-14754A  
16092

CS: 16091

ID: 14754A

Is 16091-14754A, Pts 1&2,  
I 75-5(37)302

14.5 mi of guard rail  
upgrading, culvert ext  
& sign upgrading & railing  
replac & bridge deck  
overlay on 9 brdge on  
I-75 fr M-68 N'ly to  
Levering Rd. Cheboygan  
Co. Item 32.



# STATE OF MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION

## PLANS OF PROPOSED

MICHIGAN PROJECT I-75-5(37)302  
CONTROL SECTION Is 16091 & Is 16092  
JOB NUMBER 14754A  
I-75

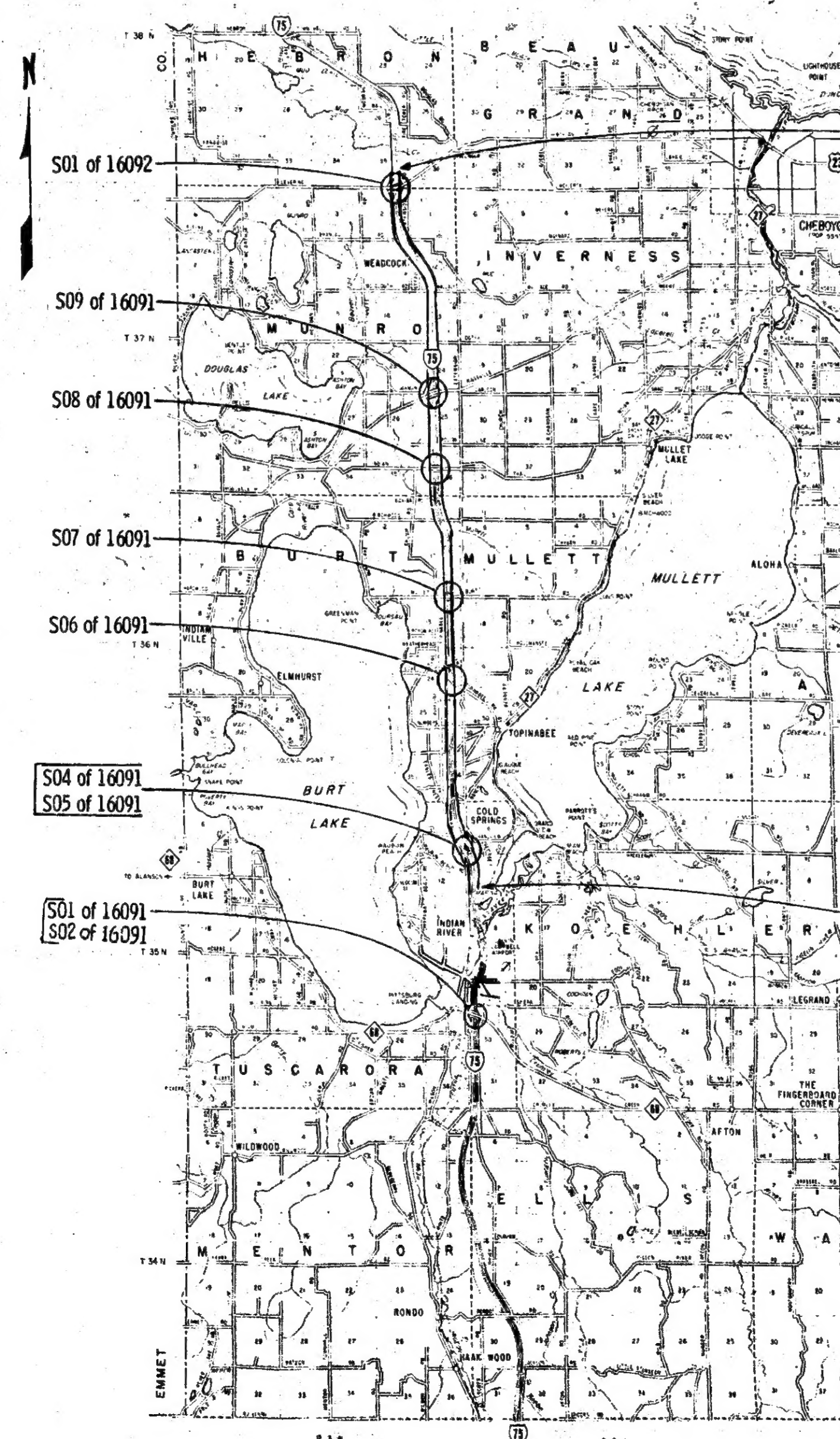
CHEBOYGAN COUNTY  
HEBRON, MUNRO, BURT, TUSCARORA & KOEHLER TWPS.

ROAD PLANS	SHEET NOS.
TITLE .....	1
NOTE SHEET .....	2
PLANS & PROFILES .....	3-15
SPECIAL DETAILS .....	16-19
QUANTITY SHEETS .....	20

ROUTE	JOB NUMBER	FEDERAL NUMBER	SHEET NO.	TOTAL SHEETS
I-75	14754A	I-75-5(37)302	1	20

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF STATE HIGHWAYS 1976 STANDARD SPECIFICATIONS AND SUPPLEMENTAL SPECIFICATIONS

LEGEND	YEAR
A.D.T. ....	1977, 5300
D.H.V. ....	
COMM. % .....	
DESIGN SPEED .....	



Michigan Project I-75-5(37)302  
Control Section Is 16091 & Is 16092  
Job Number 14754A  
End Sta. 1038+78

Michigan Project I-75-5(37)302  
Control Section Is 16091 & Is 16092  
Job Number 14754A  
Begins Sta. 282+10

### TITLE SHEET LEGEND

PROPOSED PROJECT .....	=====
EXISTING ROADS .....	=====
PAVED .....	=====
BITUMINOUS .....	=====
GRAVEL .....	=====
UNIMPROVED OR CITY STREET .....	=====
SECTION LINE .....	=====
TOWNSHIP LINE .....	=====
COUNTY LINE .....	=====
CITY OR VILLAGE LIMITS .....	=====
RAILROADS .....	=====

CONTRACT FOR SIGN UPGRADE, GUARD RAIL UPGRADE, BRIDGE RAILING REPLACEMENT & CULVERT EXTENSION			
APPROVALS			
CHECKED	<i>E. J. Zajac</i>	4/4/79	DATE
RECOMMENDED FOR APPROVAL	<i>M. Tarkenton</i>	4/4/79	DATE
RECOMMENDED FOR APPROVAL	<i>R. C. Chalmers</i>	4/6/79	DATE
RECOMMENDED FOR APPROVAL	<i>R. C. Chalmers</i>	4-10-79	DATE
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION JOHN P. WOODFORD - DIRECTOR			
APPROVED BY	<i>G. M. Condy</i>	4/19/79	DATE
PLANS PREPARED BY	WONG	DESIGN UNIT	
APPROVED		DIVISION ADMINISTRATOR	DATE
CONTROL SECTION	JOB NUMBER	FEDERAL NUMBER	SHEET NO.
Is 16091 & 16092	14754A	I-75-5(37)302	92305

Is 16091 & Is 16092 - 14754A



NOTE SHEET

RES. NO.	STATE	FEDERAL PROJECT	P.O. NO.	SHEET NO.	TOTAL SHEETS
5	MICH.			2	
ROUTE	COUNTY	CONTROL SECTION	JOB NO.		
I-75	CHEBOYGAN	Is 16091 & Is 16092	14754A		

GENERAL PLAN NOTES

UNDERGROUND UTILITIES

For protection of underground utilities, the contractor shall dial 1-800-482-7171 a minimum of 48 hours prior to excavating in the vicinity of utility lines. All "Miss Dig" participating members will thus be routinely notified. This does not relieve the contractor of the responsibility of notifying utility owners who may not be a part of the "Miss Dig" alert system.

CLASS B SODDING

Where Class B Sodding is called for in the plans, the beds shall be trimmed within the tolerances specified for Class A Slopes.

BEDDING AND FILLING

Bedding and filling around pipe culverts shall be done as specified on Standard Plan IV-82 Series.

References to "possible borrow sources" appear at various locations on these plans. These references are for the contractor's information only. No payment for earth excavation or hauling will be made for grading work at these locations. If the contractor chooses to use these areas to acquire dirt for use as embankment, the disturbed slopes shall be seeded, fertilized, and mulched at the direction of the engineer, and payment for these items will be made at the contract unit price.

Guard Rail

Prior to the contractor's ordering of curved beam guard rail elements, the engineer shall verify in the field that the radii shown on the plans are satisfactory.

Where existing guard rail is to be eliminated, it shall not be removed until the slope has been flattened as called for on plans or approved by the engineer.

Salvaged Beam Gd. Rail shall be stockpiled at a location designated by the engineer and shall be the property of the Department.

MISCELLANEOUS ESTIMATES

The following items of work shall be done as they apply throughout the project. These items are not detailed or included on the plan and profile sheets:

Topsoil Surface 3 Inches	26,190 S. Y.
Mulch (Slopes as directed by the Engineer) (Est. @ 3.0 Tons/Acre)	16 Tons
Anchoring Mulch	5 Acre
Cereal Rye Seeding	324 Lbs.
Roadside Seeding	540 Lbs.
Chemical Fertilizer Nutrient	1296 Lbs.
Mobilization	1 L.S.
Class B Sodding	5859 S.Y.
Water	15 Units
On-the-Job Training	2 Each

Erosion and Sedimentation Control Quantities:

Hay or Straw Bales	100 Each
Cereal Rye Seeding	120 Lbs.
Mulch (Est. @ 3.0 Tons/Acre)	6 Tons
Anchoring Mulch	2 Acre
Temporary Fence (Used to anchor Bales)	200 LFt.

Items of Work to be used for Maintaining Traffic during construction are included in Bridge Plans.

PUBLIC UTILITIES

The existing utilities listed below and shown on these plans represent the best information available as obtained from our Utility Section on October 24, 1978. This information does not relieve the contractor of the responsibility to satisfy himself as to their accuracy or of his responsibility in case utilities have been changed since the above date.

NAME AND ADDRESS OF OWNER	KIND OF UTILITY
Michigan Bell Telephone Co.	Telephone
Consumers Power Co.	Electric
Consumers Power Co.	Gas

Owners of public utilities will not be required by the Department to move additional poles and structures that are not within grading or structure limits in order to facilitate the operation of construction equipment, unless it is determined by the engineer that such pole line or structures constitute a hazard to the public or are extraordinarily dangerous to the Contractor's operations.

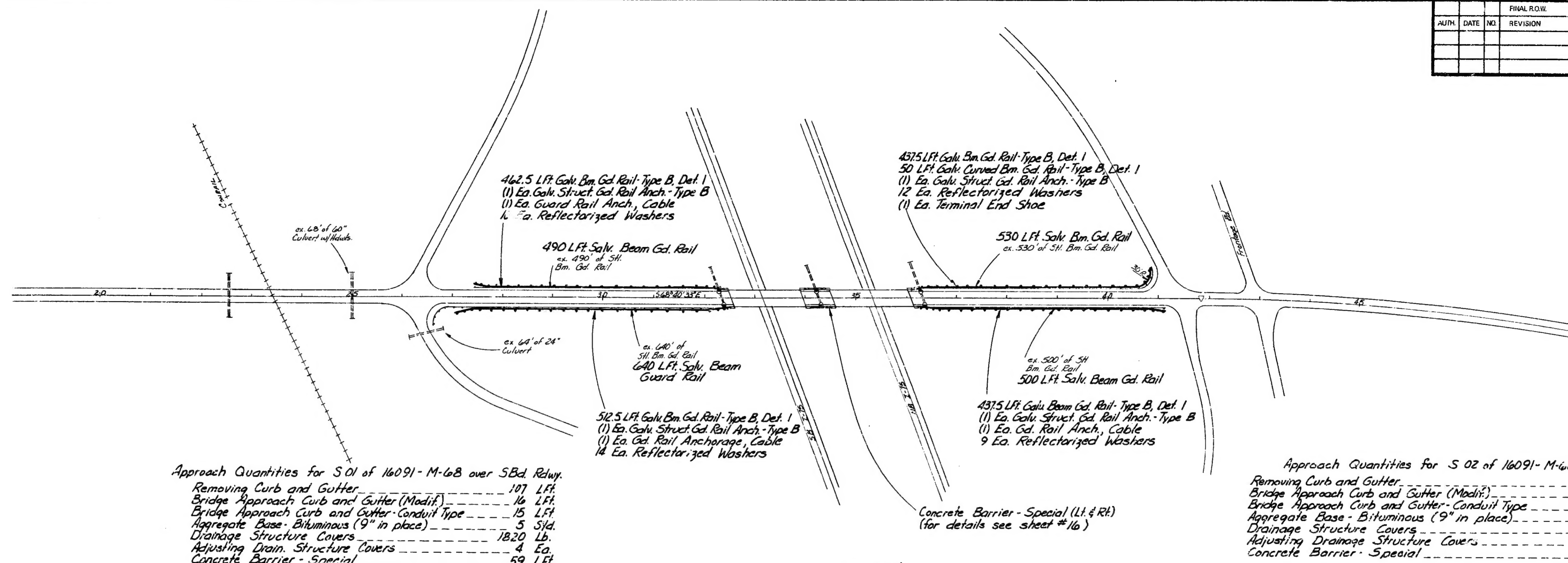
NOTES APPLYING TO STANDARD PLANS

Where the following items are called for on plans, they are to be constructed according to standard plan given below opposite each item unless otherwise indicated.

Catch Basins and Inlets	I-5C
Cover E	I-10A
Buffered End (For Beam Guard Rail)	III-57A *(See Exception)
Guard Rail Ending with Cable Anchorage	III-58D
Guard Rail at Structures	III-59C
Beam Guard Rail - Types A, B, and C	III-60C *(See Exception)
Structure Guard Rail Anchorage (Type B)	III-68B
Granular Blanket, Underdrains, & 6" Culvert End Section	IV-80A
Bedding and Filling around Pipe Culverts	IV-82D
Outlet Headwalls, Concrete Rings, Drainage Marker, Mailbox & Wood Guard Posts	IV-85C
Precast Concrete End Section for Pipe Culvert	IV-86A (Except the Concrete Shall Have Air Entrained Content of 6 ± 2 Percent)
Steel End Section	IV-88A
*(Exception) Buffered Ends, Curved Beam Elements, Terminal End Shoes, and Special End Shoes will be same Material as adjacent Run of Guard Rail.	
Soil Erosion & Sedimentation Control Measures	V-96B
Sodding	VI-100A
Special Details not listed under Standard Plans	
	SPECIAL DETAIL
Steel Grate for Precast Concrete End Section	4
Fillerwalls between Existing Bridge Piers	5
Structure Guard Rail Anchorage (Type A)	Special Detail 7-1



FINAL R.O.W.			
AUTH.	DATE	NO.	REVISION



this sheet  
For Information Only  
Cover D-----6

M- 68

Filler Wall Quantities						
Structure Number	Crossroad	Number of Bays	Width of Bay	Filler Wall Conc. Grade 35	Steel Reinforcement	3/4" Expansion Anch. Bolts
S 04 of 16091	US-27	5	9'-4"	13.0	691	80
S 05 of 16091	US-27	5	9'-5"	13.1	695	80
S 06 of 16091	Topinabee Rd.	4	7'-7 3/4"	8.5	422	64
S 07 of 16091	Miami Beach Rd.	2	9'-6"	5.3	279	32
S 08 of 16091	Indian Trail Rd.	2	9'-6 3/4"	5.3	279	32
S 09 of 16091	Riggsville Rd.	2	10'-4 1/2"	5.7	293	32
TOTALS				51 Cu.Yds.	2659 Lbs.	320 Each

Entire Project Quantities  
For restoration of slopes at locations  
of culvert extensions and maint. x-overs.

Embankment (CIP)----- 5049 C.Yds.  
Topsoil Surface - 3"----- 23,100 S.Yds.  
Mulch----- 15 Tons  
Anchoring Mulch----- 5 Acres  
Cereal Rye Seeding----- 286 Lbs.  
Roadside Seeding----- 477 Lbs.  
Chemical Fertilizer Nutrient----- 1065 Lbs.

③ indicates soil erosion & sedimentation control  
measure. See Standard Plan V-96B. Use  
snow fence for added stability.



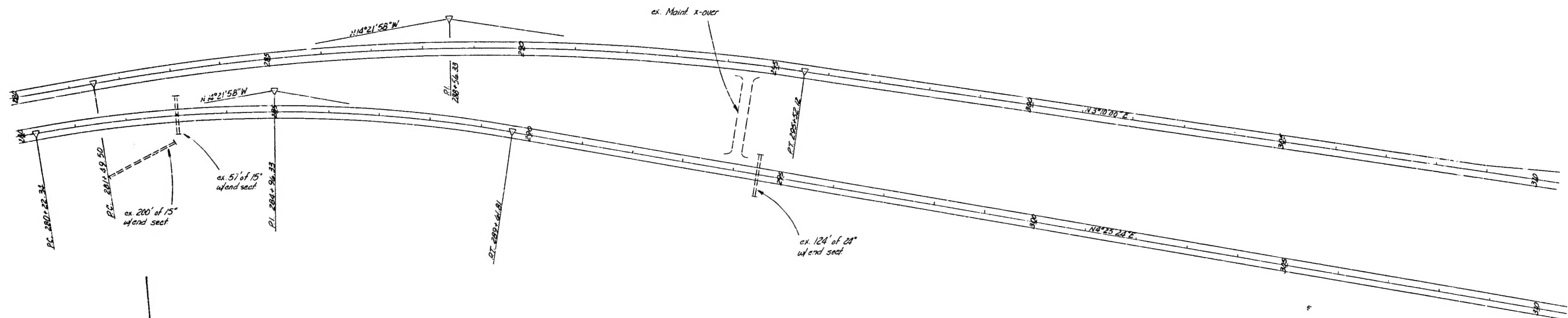
DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1"= 100'	16091 16092	14754A	WONG	3



FINAL ROW			
DATE	NO.	REVISION	

Curve Data (N.Bd)  
 $\Delta = 18^\circ 41' 22''$  Rt  
 $D = 2^\circ 00' 00''$   
 $R = 2864.79'$   
 $T = 473.99'$   
 $L = 939.47'$   
 $E = 38.95'$   
 $PC = 280+22.34$   
 $PI = 284+56.33$   
 $PT = 289+61.81$

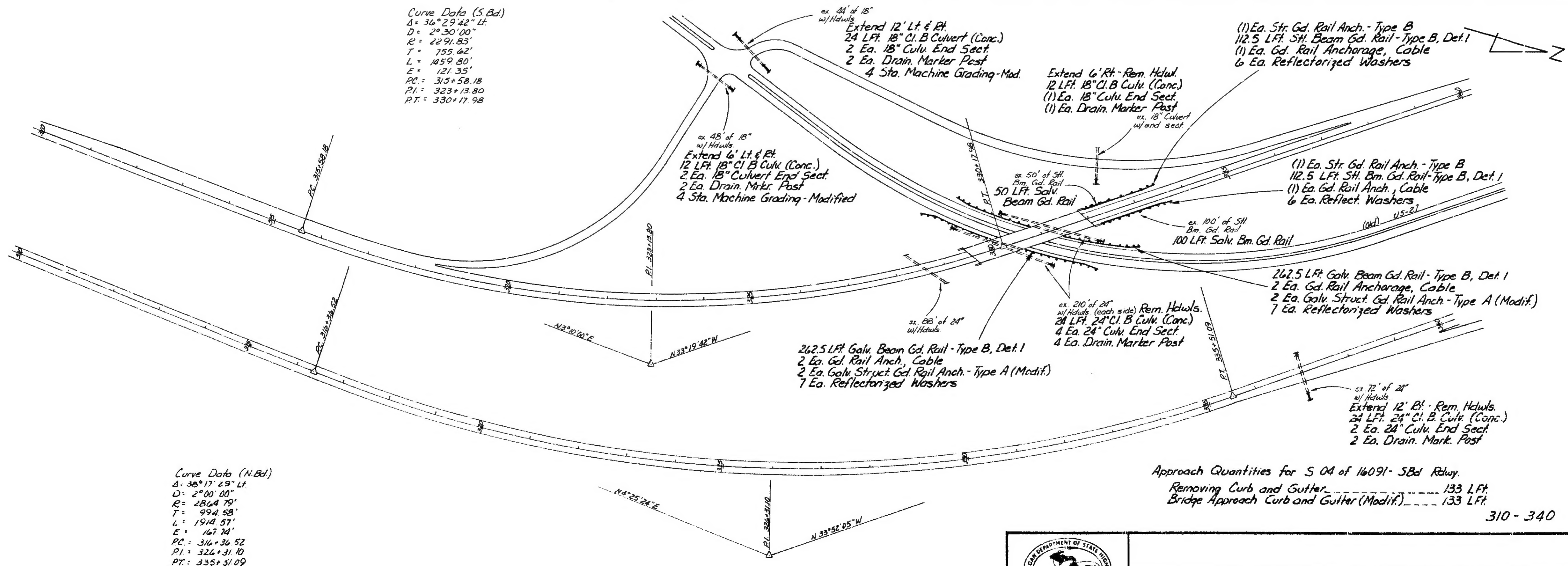
Curve Data (S.Bd)  
 $\Delta = 17^\circ 31' 58''$  Rt  
 $D = 1^\circ 15' 40''$   
 $R = 4583.46'$   
 $T = 704.83'$   
 $L = 1402.62'$   
 $E = 54.18'$   
 $PC = 281+49.50$   
 $PI = 288+56.33$   
 $PT = 295+52.12$



Mich. Proj. I-75-5(37)302  
 State Proj. Is 16091  
 Job No. 14754 A  
 Begins Sta. 282+10

P.O.B. - 310

Curve Data (S.Bd)  
 $\Delta = 36^\circ 29' 42''$  Lt  
 $D = 2^\circ 30' 00''$   
 $R = 2291.83'$   
 $T = 755.62'$   
 $L = 1459.80'$   
 $E = 121.35'$   
 $PC = 315+58.18$   
 $PI = 323+13.80$   
 $PT = 330+17.98$



Curve Data (N.Bd)  
 $\Delta = 38^\circ 17' 29''$  Lt  
 $D = 2^\circ 00' 00''$   
 $R = 2864.79'$   
 $T = 994.58'$   
 $L = 1910.51'$   
 $E = 167.74'$   
 $PC = 316+36.52$   
 $PI = 326+31.10$   
 $PT = 335+51.09$

Approach Quantities for S 04 of 16091 - S.Bd Rwy.  
 Removing Curb and Gutter..... 133 L.Ft.  
 Bridge Approach Curb and Gutter (Modif.)..... 133 L.Ft.

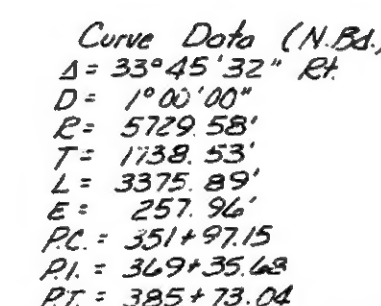
310 - 340



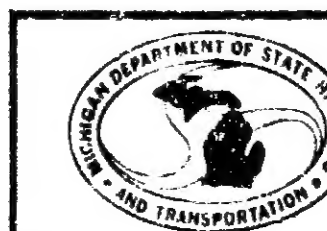
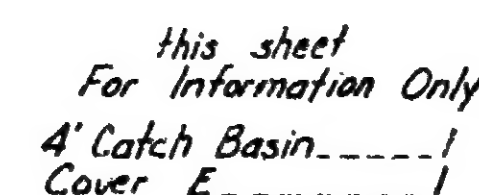
DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16091	14754A	WONG	4



Curve Data (S.Bd.)  
 $\Delta = 28^{\circ}36'13''$  est.  
 $D = 1^{\circ}00'10''$   
 $R = 5729.58'$   
 $T = 1160.64'$   
 $L = 2860.36'$   
 $E = 183.25'$   
 $PC = 345 + 23.18$   
 $PI = 359 + 83.82$   
 $PT = 373 + 83.54$



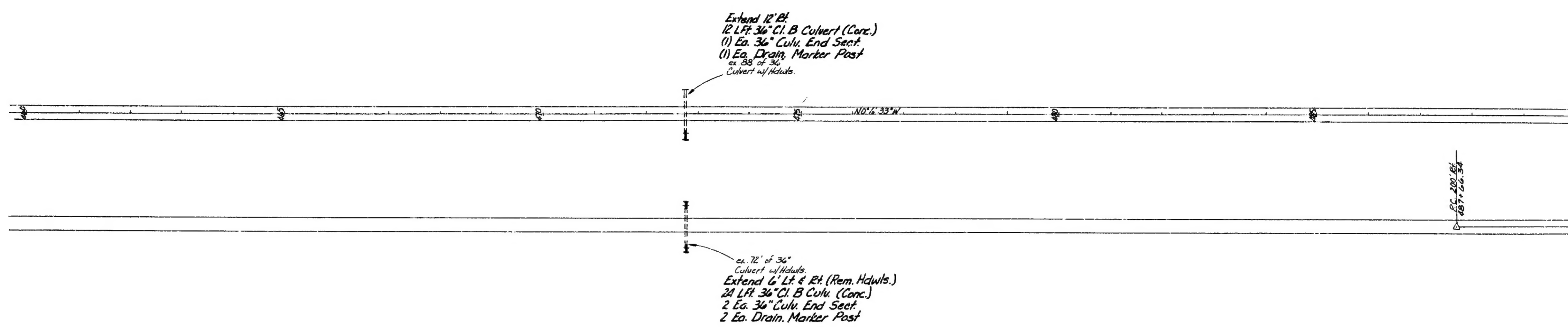
Curve Data (S.Bd.)  
 $\Delta = 4^{\circ}36'56''$  Rt.  
 $D = 0^{\circ}45'00''$   
 $R = 1639.44'$   
 $T = 307.87'$   
 $L = 615.41'$   
 $E = 6.20'$   
 $PC = 394+84.58$   
 $PI = 397+92.45$   
 $PT = 400+99.99$  Back =  
 401+30.14 Ahead



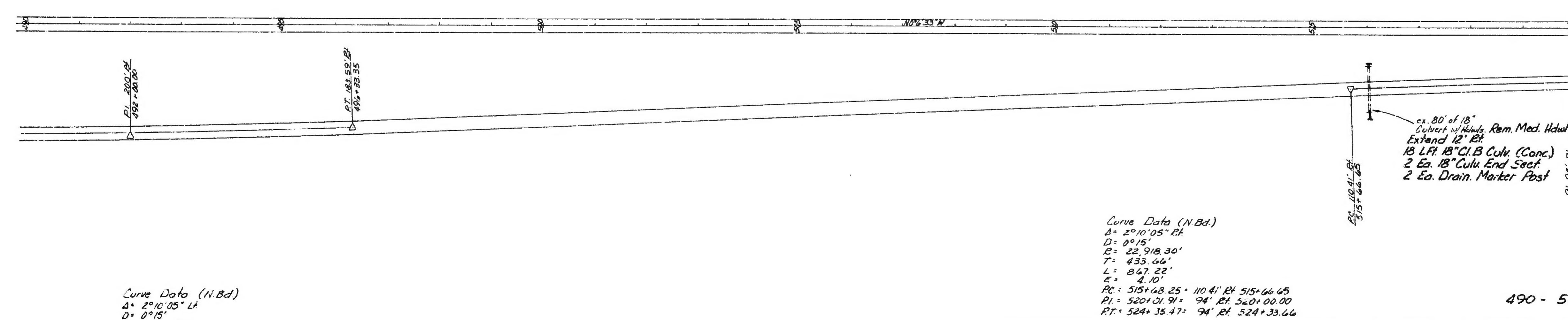
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	1" = 100'	16091	14754A	WONG	R. O. W.	CONS.
						5



FINAL ROW		
AUTH.	DATE	NO.
REVISION		



460 - 490

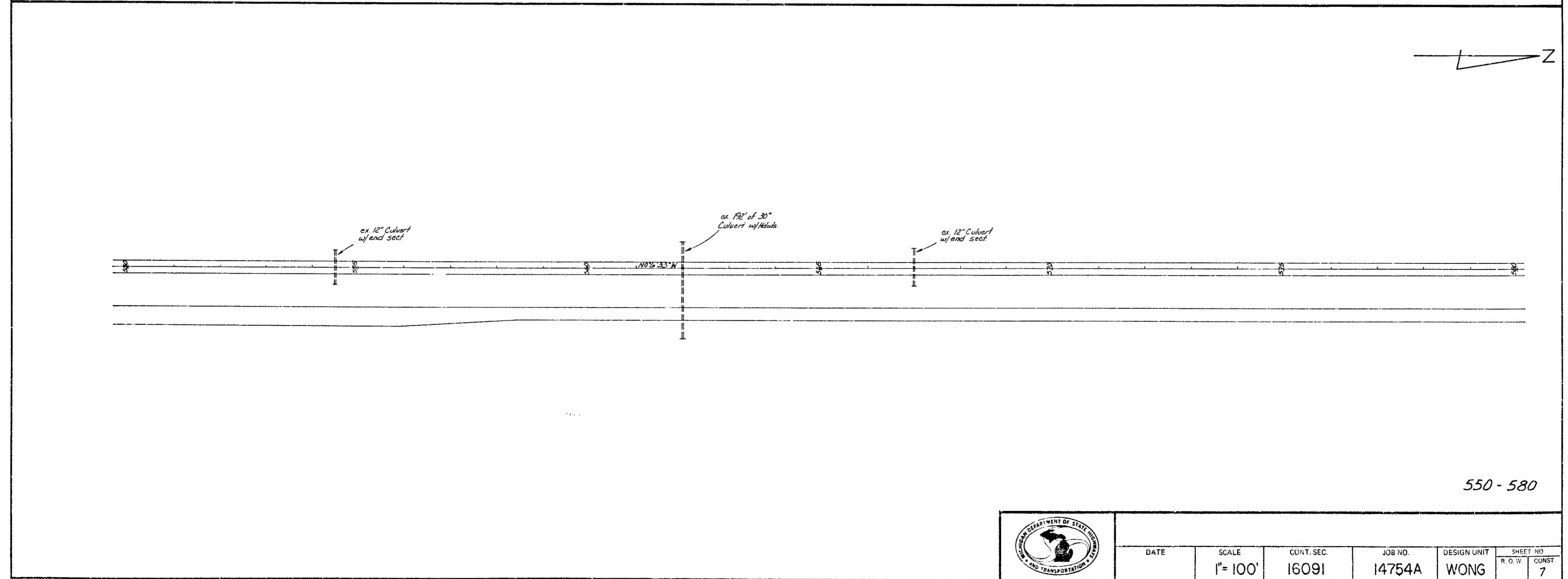
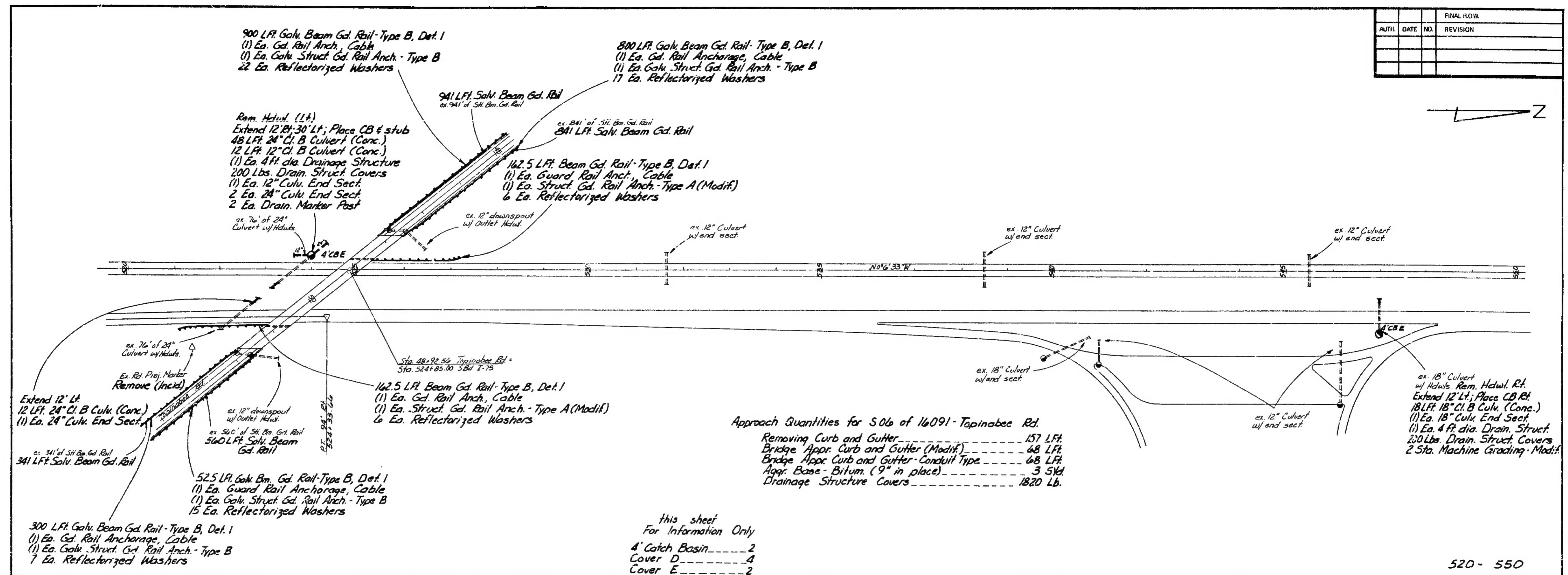


490 - 520

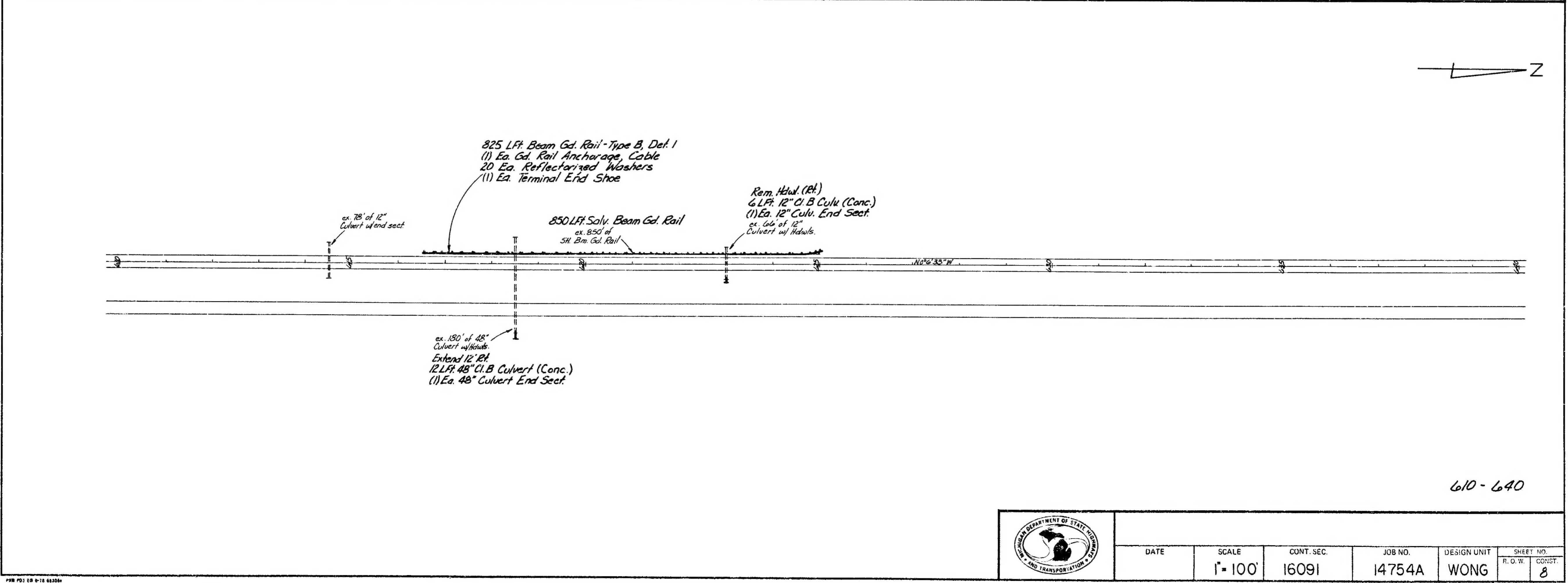
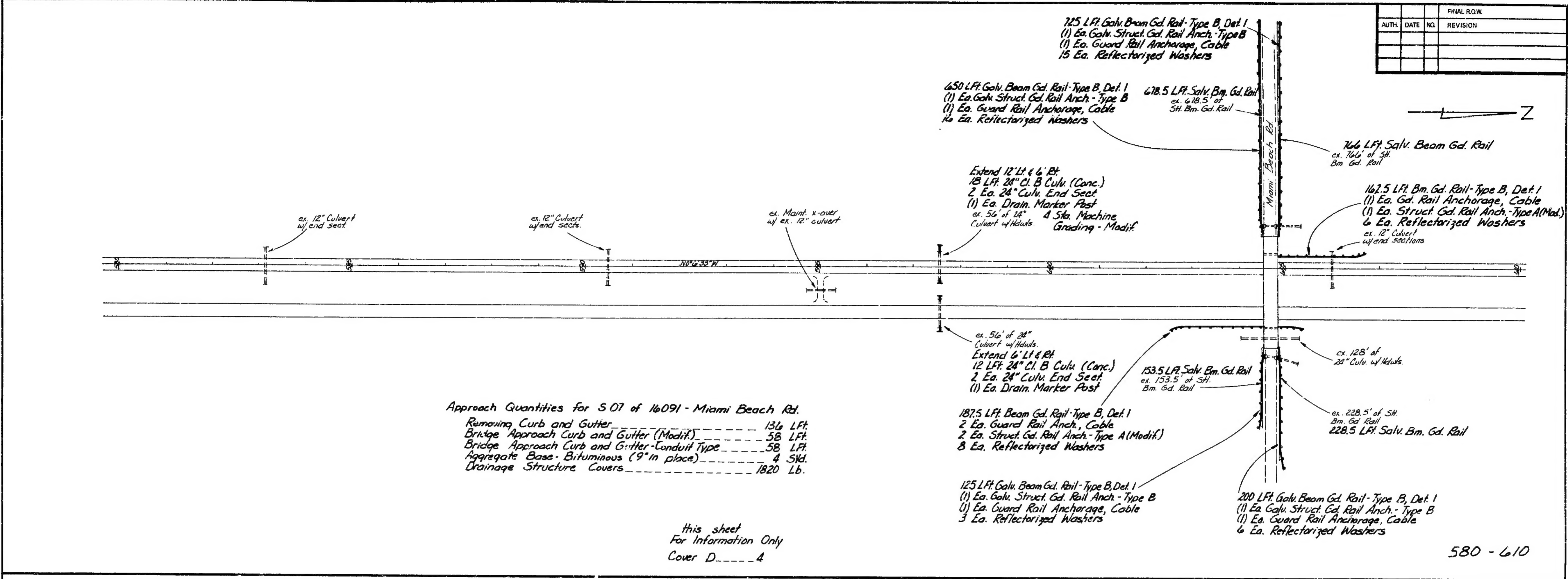
Curve Data (N.Bd.)  
 $\Delta = 2^\circ 10' 05''$  Lt  
 $D = 0^\circ 15'$   
 $R = 22,918.30'$   
 $T = 433.46'$   
 $L = 867.22'$   
 $E = 4.10'$   
 $PC = 487+46.34 = 200' Rt. 487+66.34$   
 $PT = 492+10.00 = 200' Rt. 492+00.00$   
 $PI = 496+33.56 = 183.55' Rt. 496+33.35$

Curve Data (N.Bd.)  
 $\Delta = 2^\circ 10' 05''$  Rt  
 $D = 0^\circ 15'$   
 $R = 22,918.30'$   
 $T = 433.46'$   
 $L = 867.22'$   
 $E = 4.10'$   
 $PC = 515+63.25 = 110.41' Rt. 515+66.45$   
 $PT = 520+01.91 = 94' Rt. 520+00.00$   
 $PI = 524+35.47 = 94' Rt. 524+33.66$

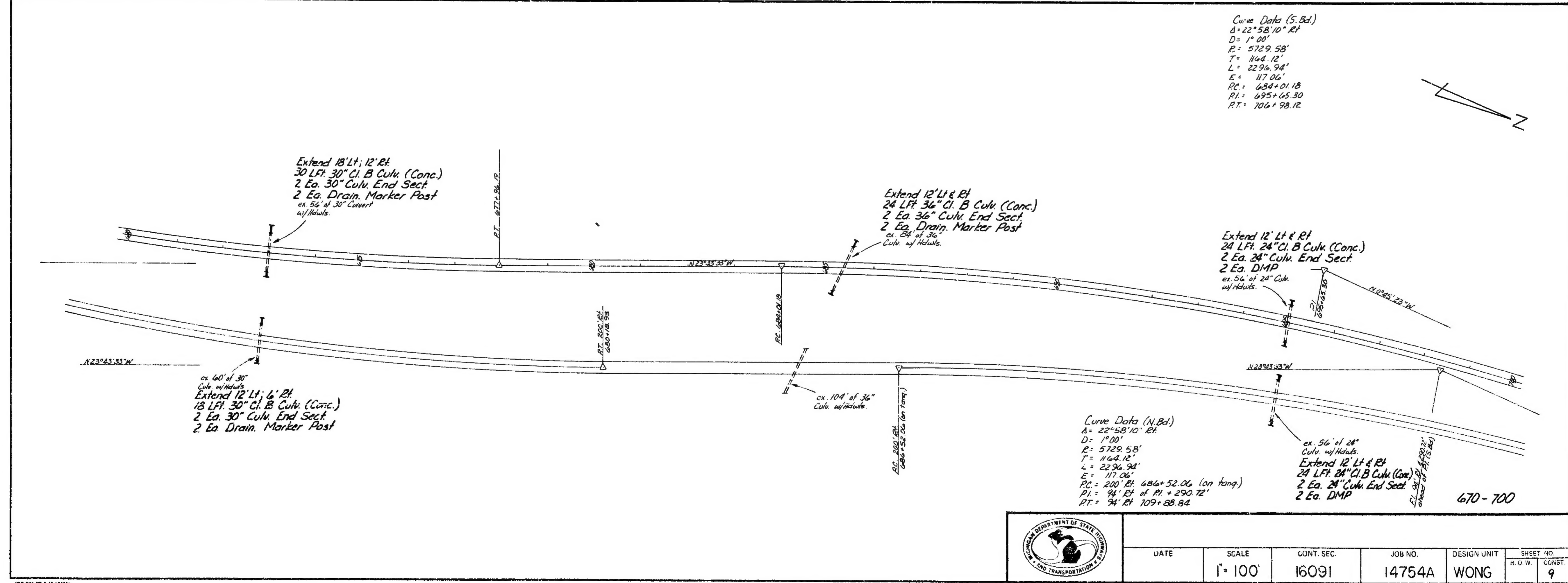
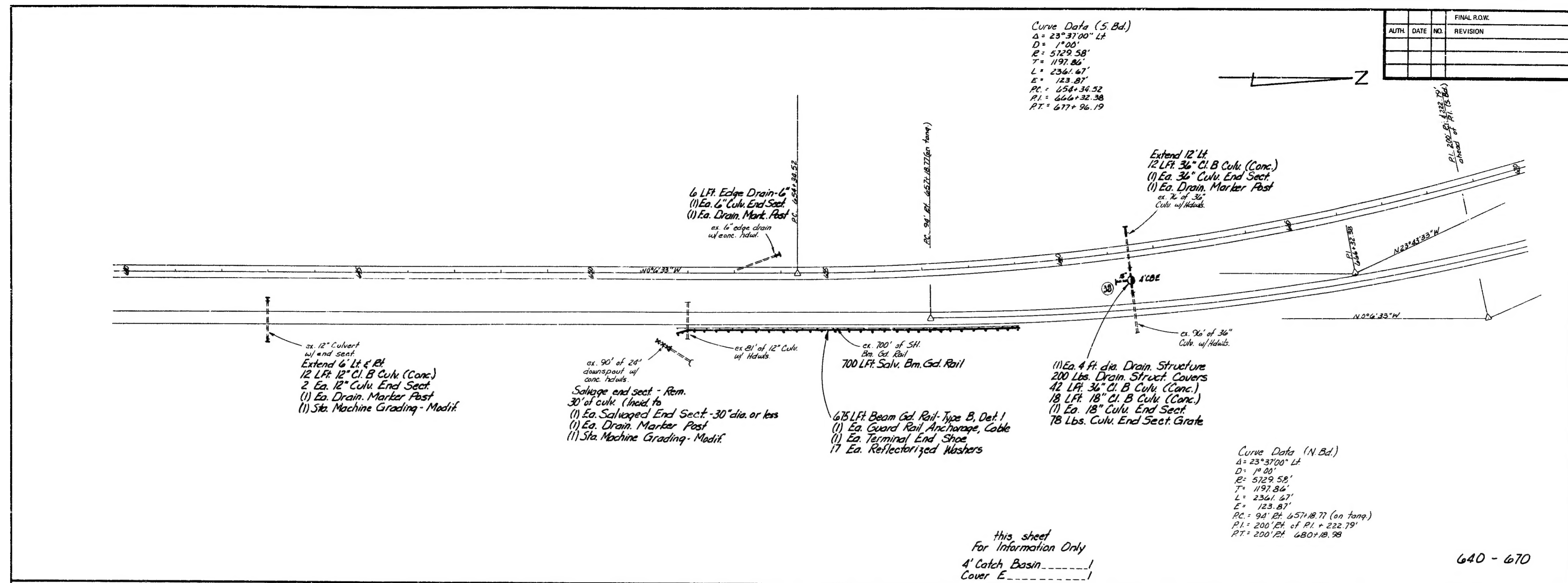
	DATE		SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.	
			1" = 100'				R.O.W.	CONST.
				16091	14754A	WONG	6	6





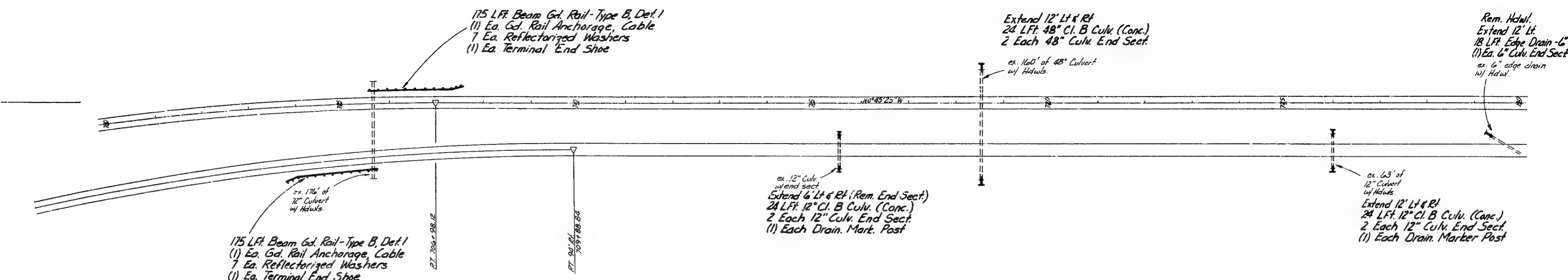








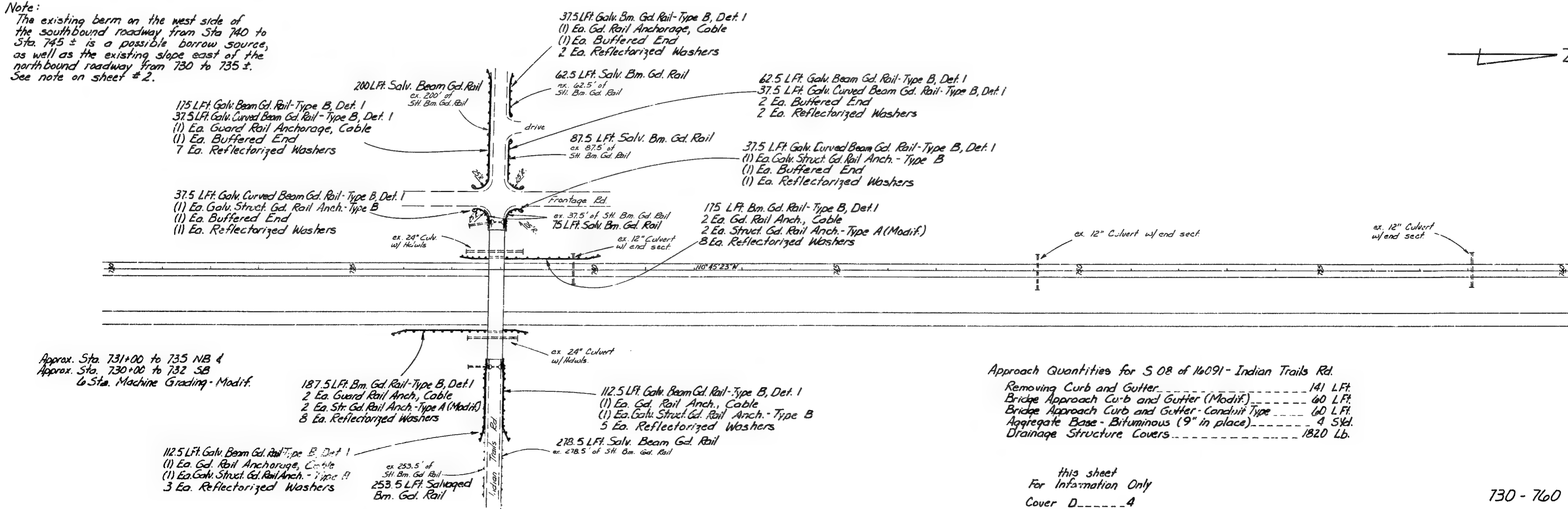
FINAL R.O.W.			
AUTH.	DATE	NO.	REVISION



700 - 730

**Note:**

The existing berm on the west side of the southbound roadway from Sta 740 to Sta 745 ± is a possible borrow source, as well as the existing slope east of the northbound roadway from 730 to 735 ±. See note on sheet # 2.



730 - 760

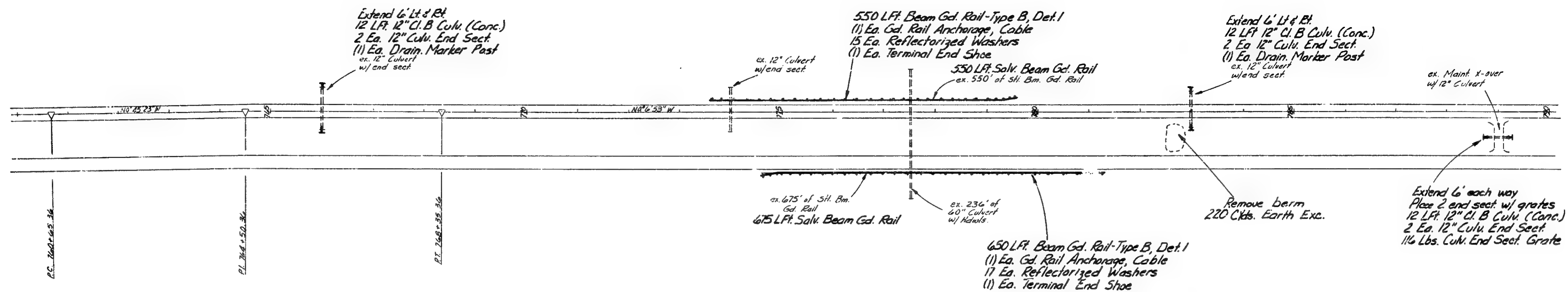
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Cover D-----4



DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16091	14754A	WONG	10



FINAL ROW			
AUTH	DATE	NO.	REVISION



760 - 790

Bridge Approach Guard Rail Quantities

	NE Quad.	NW Quad.	SW Quad.	SE Quad.	Total
Galv. Beam Guard Rail - Type B, Det. 1	112.5 L.F.	162.5 L.F.	250 L.F.	112.5 L.F.	637.5 L.F.
Galv. Curved Beam Gd. Rail - Type B, Det. 1	-	-	112.5 L.F.	-	112.5 L.F.
Guard Rail Anchorage, Cable	1 Ea.	1 Ea.	-	1 Ea.	3 Each
Galv. Struct. Gd. Rail Anchorage, Type B	1 Ea.	1 Ea.	1 Ea.	1 Ea.	4 Each
Reinforced Washers	4 Ea.	5 Ea.	7 Ea.	4 Ea.	20 Each
Terminal End Shoes	-	-	1 Ea.	-	1 Each

Approach Quantities for 509 of 16091 (Riggsville Rd.)

Removing Curb and Gutter----- 138 L.F.

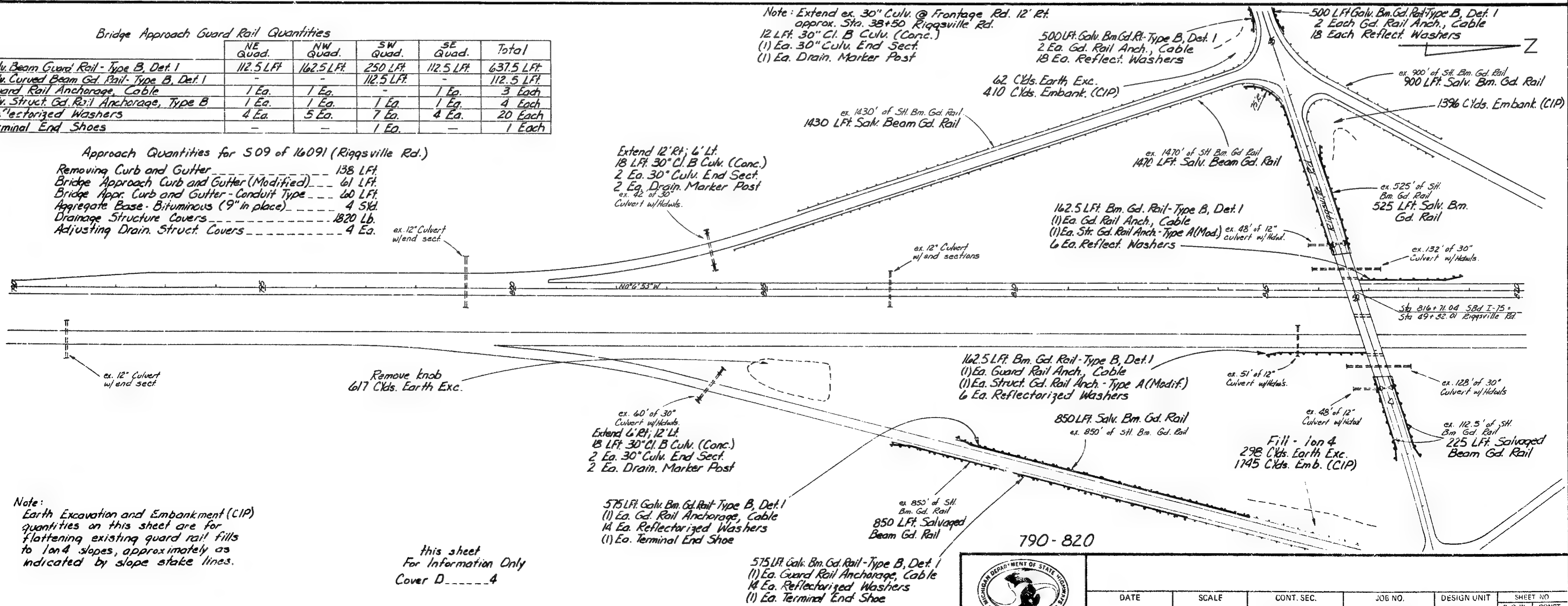
Bridge Approach Curb and Gutter (Modified)----- 61 L.F.

Bridge Appr. Curb and Gutter - Conduit Type----- 60 L.F.

Aggregate Base - Bituminous (9\" in place)----- 4 5yd.

Drainage Structure Covers----- 1820 Lb.

Adjusting Drain. Struct. Covers----- 4 Ea.



Note:  
Earth Excavation and Embankment (CIP)  
quantities on this sheet are for  
flattening existing guard rail fills  
to 1 on 4 slopes, approximately as  
indicated by slope stake lines.

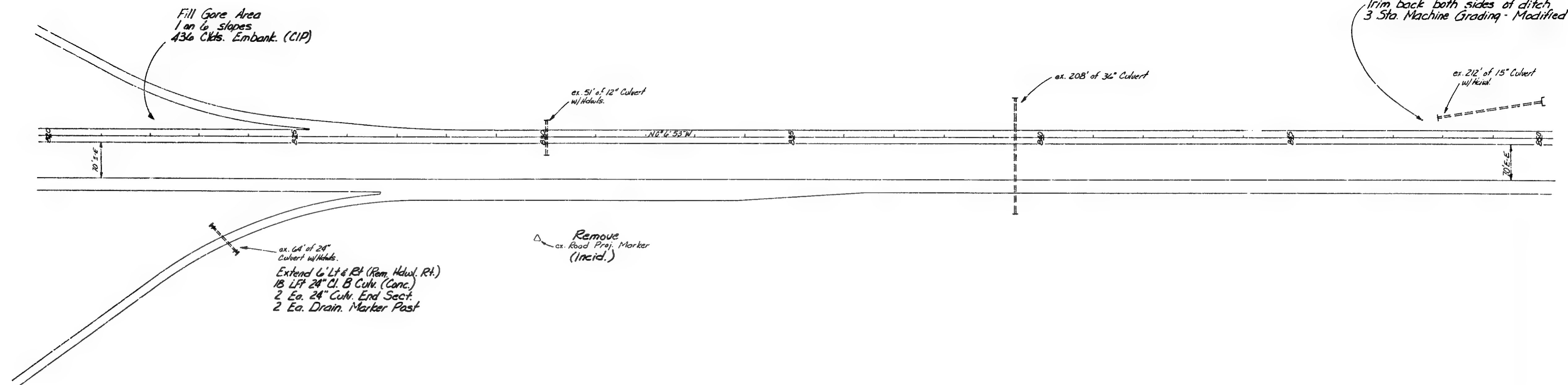
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Cover D----- 4



DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16091	14754A	WONG	11

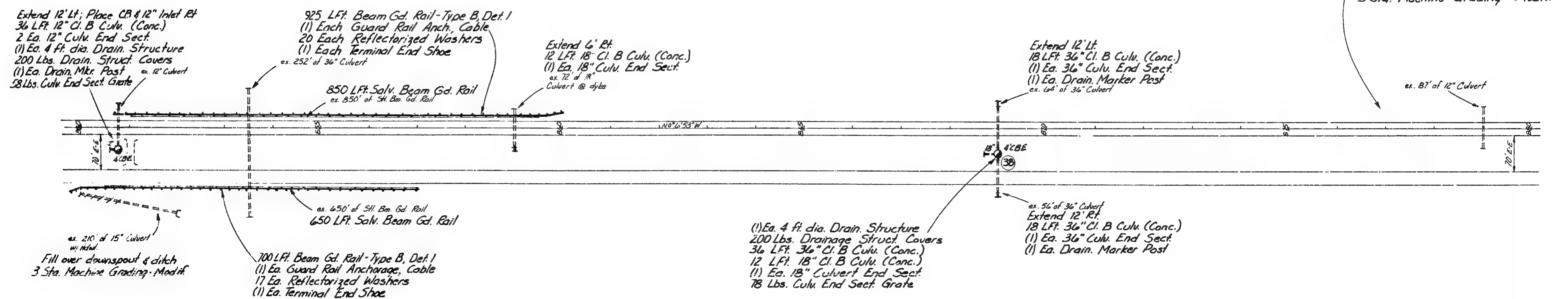


FINAL R.O.W.			
AUTH.	DATE	NO.	REVISION



820 - 850

Note:  
There is a possible source of  
Darrow left of S&D Railway from  
Sta. 841± to Sta. 846±.  
See note on sheet # 2.



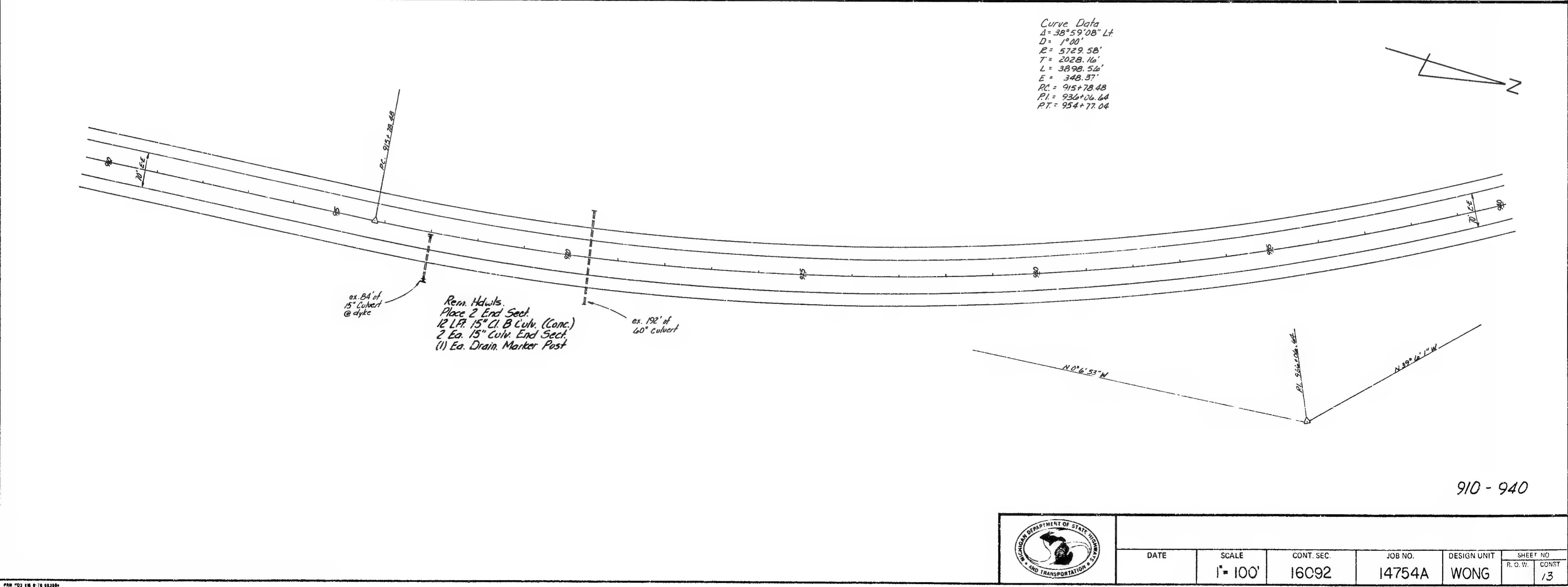
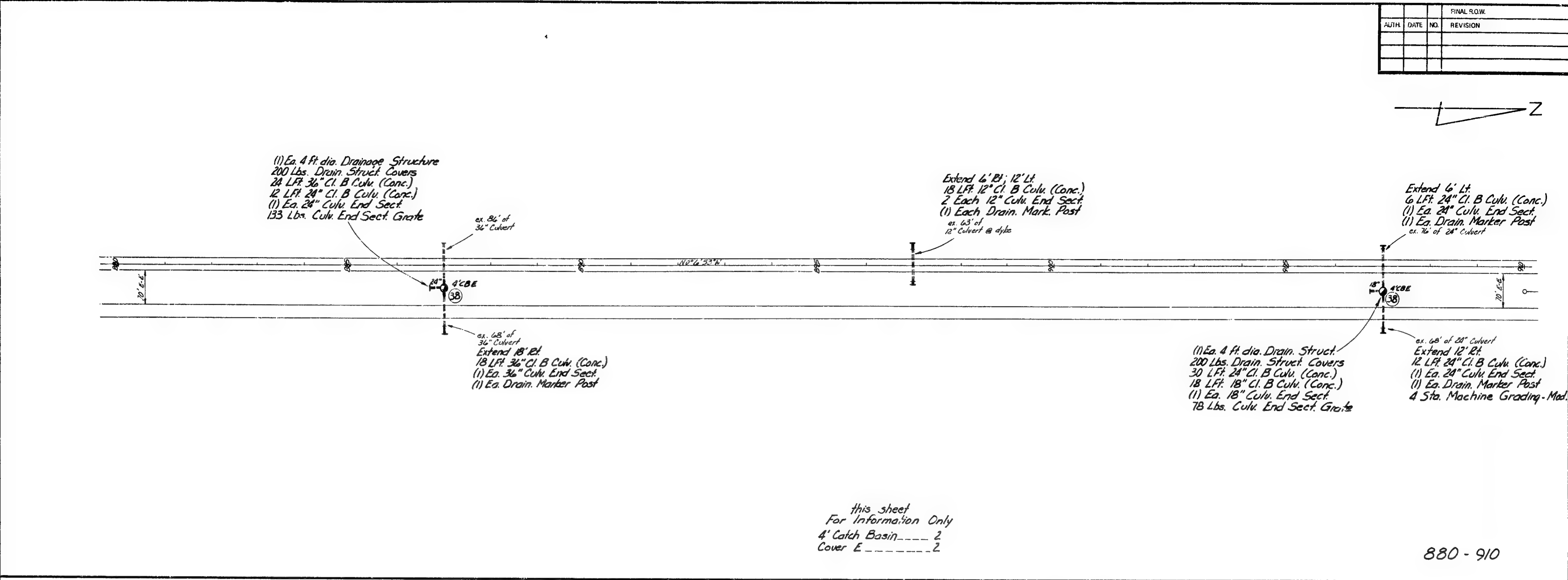
850 - 880

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4' Catch Basin ----- 2  
Cover E ----- 2



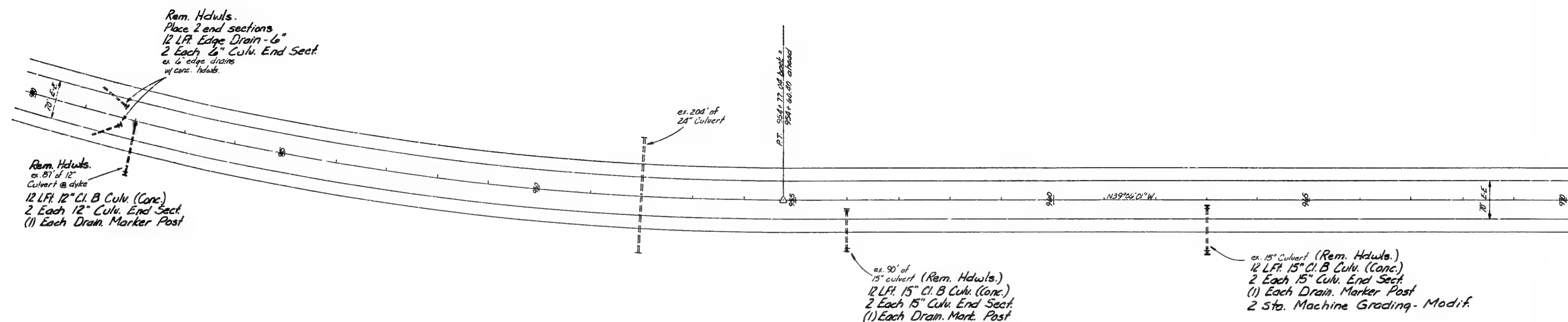
DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16091 16092	14754A	WONG	12



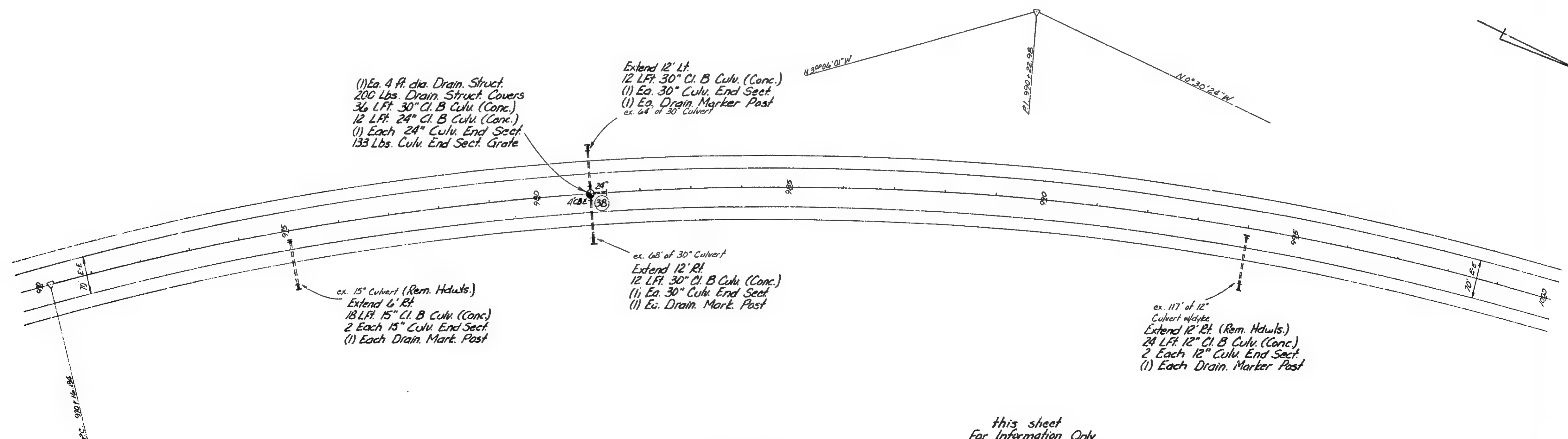




FINAL R.O.W.			
AUTH	DATE	NO.	REVISION



940 - 970



970 - 1000

Curve Data  
 $\Delta = 38^\circ 35' 37''$  Rt  
 $D = 1900'$   
 $E = 5729.58'$   
 $T = 2006.14'$   
 $L = 3859.36'$   
 $E = 341.06'$   
 $PC = 970 + 16.84$   
 $PI = 990 + 22.98$   
 $PT = 1008 + 76.20$

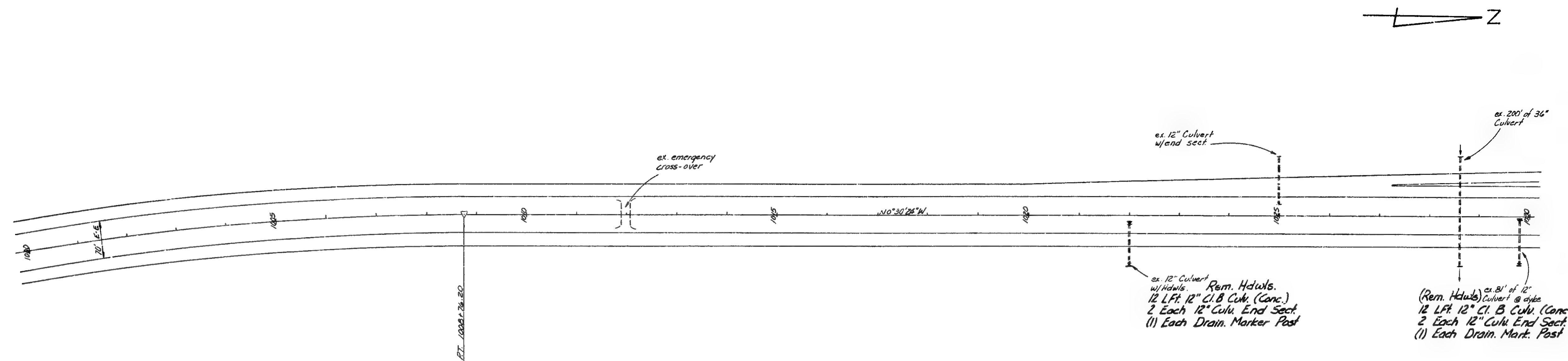
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 For Information Only  
 4' Catch Basin ----- 1  
 Cover E ----- 1



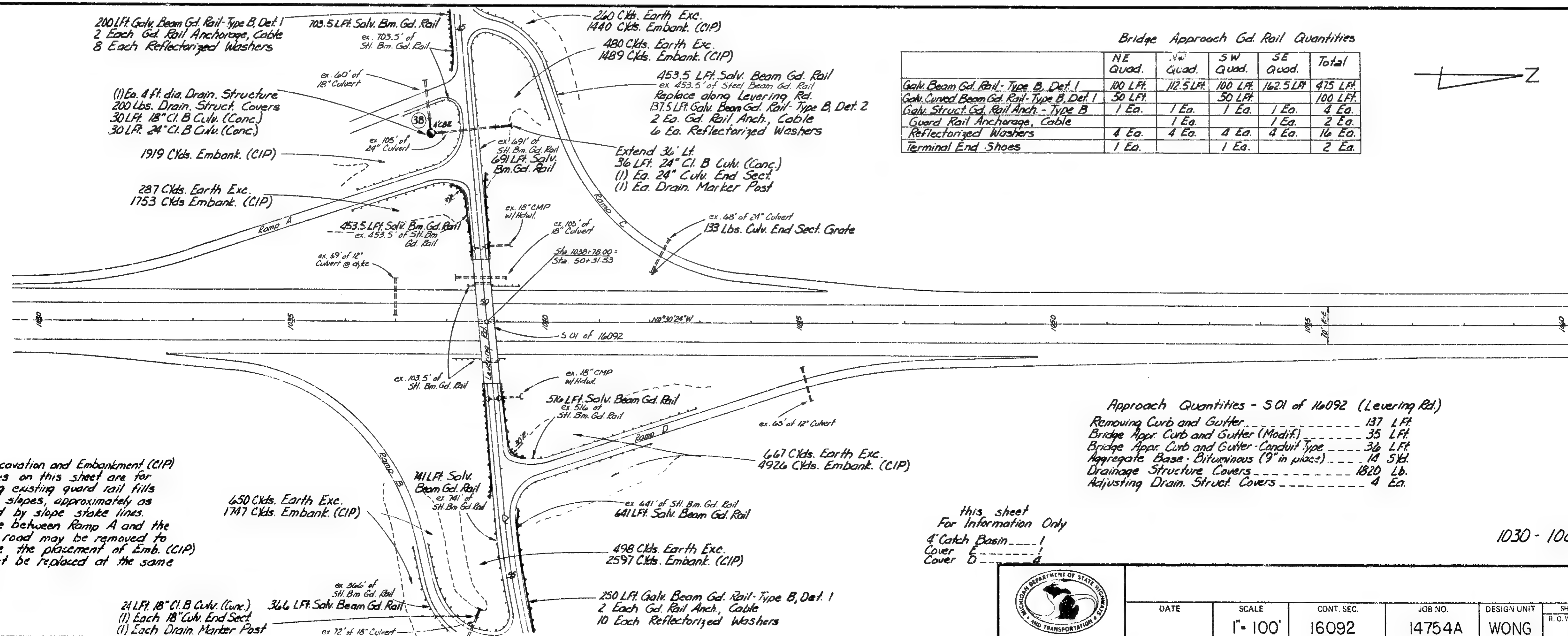
DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16092	14754A	WONG	14



FINAL R.O.W.			
AUTH.	DATE	NO.	REVISION



1000 - 1030



Bridge Approach Gd. Rail Quantities

	NE Quad.	SW Quad.	SE Quad.	Total
Galv. Beam Gd. Rail - Type B, Det. 1	100 L.F.	112.5 L.F.	100 L.F.	475 L.F.
Galv. Curved Beam Gd. Rail - Type B, Det. 1	50 L.F.	50 L.F.	50 L.F.	100 L.F.
Galv. Struct. Gd. Rail Anch. - Type B	1 Ea.	1 Ea.	1 Ea.	4 Ea.
Guard Rail Anchorage, Cable	1 Ea.	1 Ea.	1 Ea.	2 Ea.
ReflectORIZED Washers	4 Ea.	4 Ea.	4 Ea.	16 Ea.
Terminal End Shoes	1 Ea.	1 Ea.	1 Ea.	2 Ea.

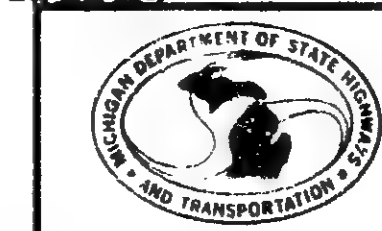
Approach Quantities - S.O.I. of 16092 (Levering Rd.)

Removing Curb and Gutter	137 L.F.
Bridge Appr. Curb and Gutter (Modif.)	35 L.F.
Bridge Appr. Curb and Gutter - Conduit Type	36 L.F.
Aggregate Base - Bituminous (9" in place)	14 S.Yd.
Drainage Structure Covers	1820 Lb.
Adjusting Drain Street Covers	4 Ea.

Note:  
Earth Excavation and Embankment (CIP) quantities on this sheet are for flattening existing guard rail fills to 1 on 4 slopes, approximately as indicated by slope stake lines. The fence between Ramp A and the frontage road may be removed to facilitate the placement of Emb. (CIP) but must be replaced at the same location.

this sheet  
For Information Only  
4' Catch Basin - 1  
Cover E - 1  
Cover B - 4

1030 - 1060



DATE	SCALE	CONT. SEC.	JOB NO.	DESIGN UNIT	SHEET NO.
	1" = 100'	16092	14754A	WONG	15



Any guard rail that is to be removed shall be salvaged and stockpiled at location on the project directed by the Engineer and shall become the property of the M.D.S.H.T.

When removing "Guard Rail Anchorage-Single", the removal of the concrete footing shall be incidental to "Rem Beam Guard Rail".

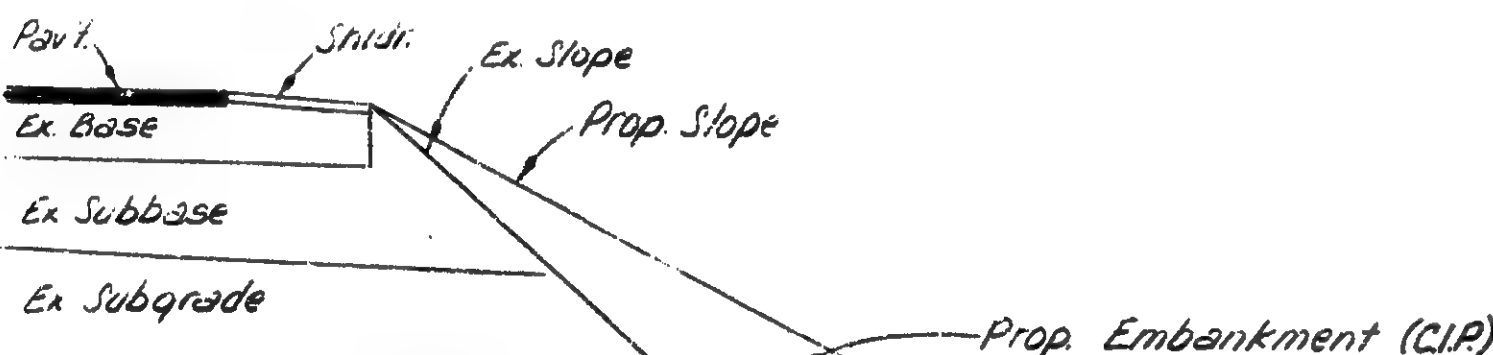
Dimensions on the plan sheets shown (OD) indicate distance from edge of metal.

All guard rail on this project shall have wood posts.

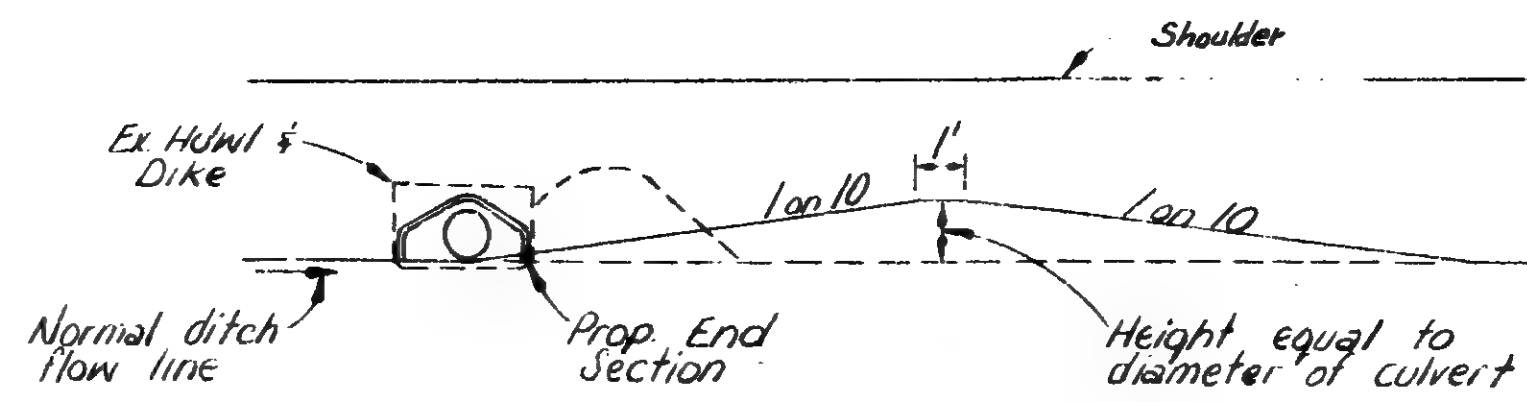
It is the plan intent to leave the existing headwalls on culvert extensions, except where removal of existing headwalls is called for on plans. Existing headwalls which are not to be removed are to be covered with embankment. Embankment to reshape the slope will be paid for at the contract unit price per cubic yard (C.I.P.).

Where removal of existing headwall is called for on plans, a 6-foot section of concrete culvert is included in the plan quantity to replace the broken section. Removal of the headwall will not be paid for separately, but shall be incidental to the culvert extension.

A quantity of "Class B bedding" and "Embankment (C.I.P.)" for culvert extensions and for flattening slopes at median lines and cross-overs is included in the miscellaneous estimate and plan sheet quantities. These items shall be placed immediately after grading operations. Bed shall be placed in the area immediately around the end sections and bedding shall be placed at remainder of the area.

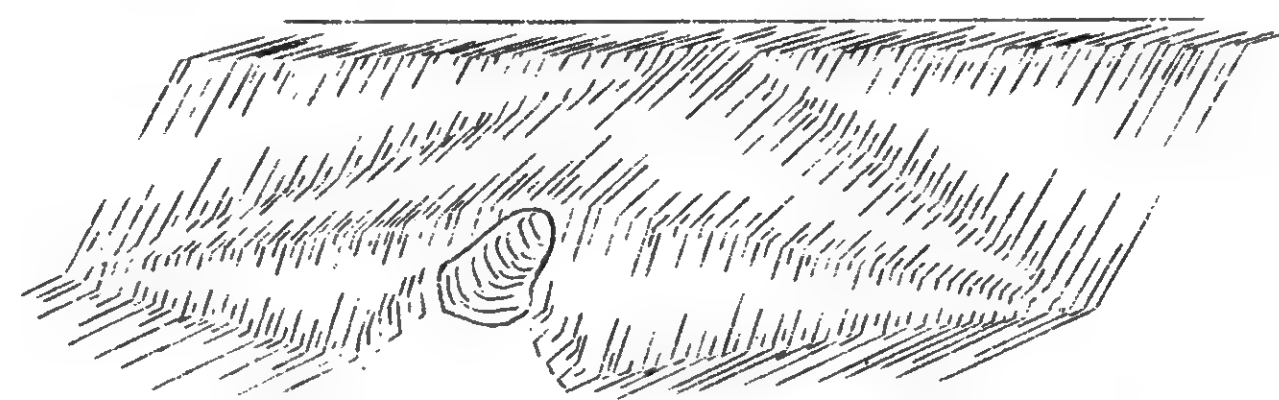


SKETCH SHOWING SLOPE FLATTENING



DETAIL FOR DIKES IN DITCHES

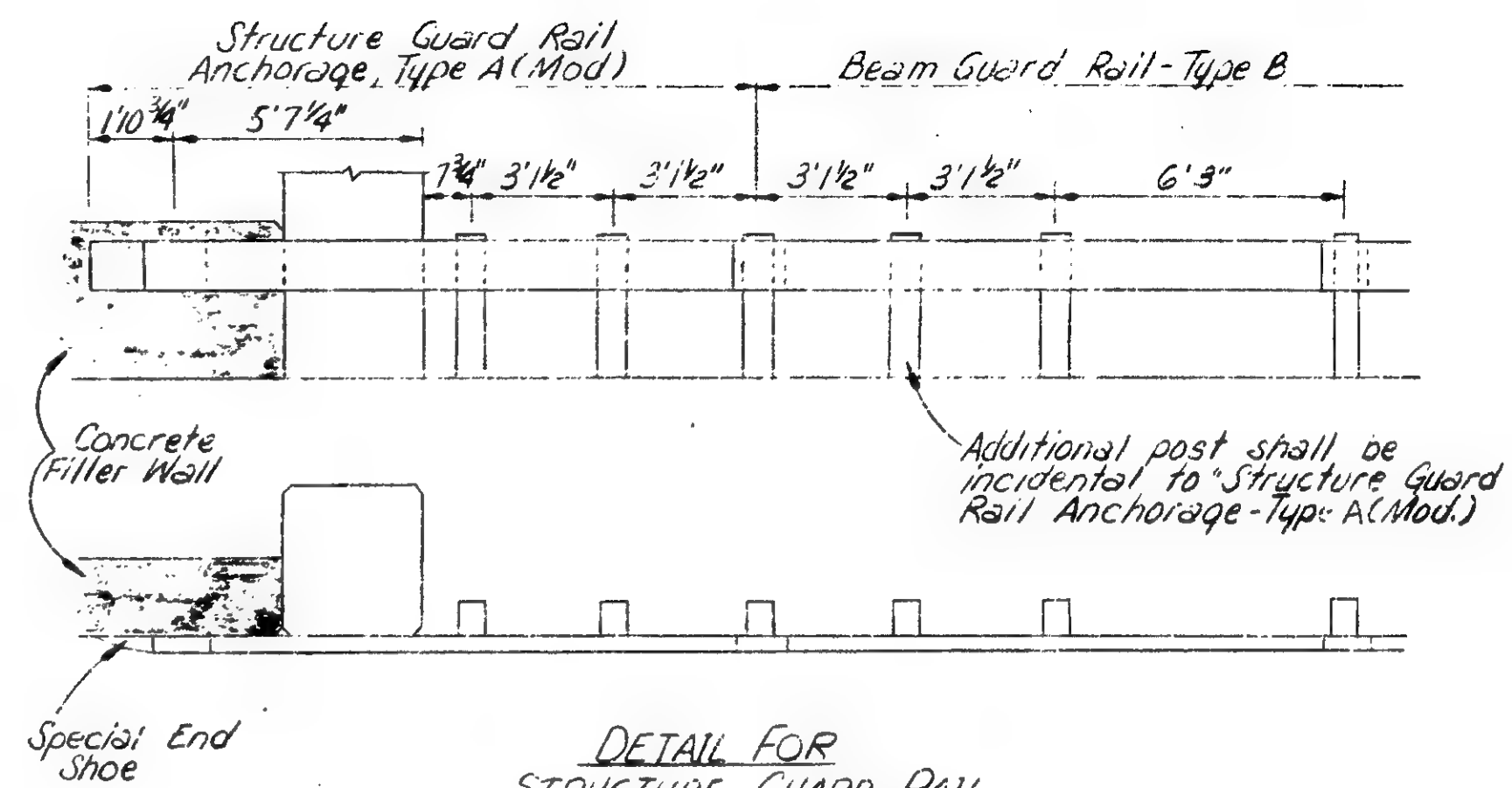
The slopes on median crossovers shall also be flattened to 1 on 10. Embankment quantities are included in the quantities for entire project on sheet #3.



CULVERT EXTENSIONS

When the extension is beyond the slope, additional embankment shall be placed as shown, with a maximum slope of 1 on 10.

5	MICH
175	Chesapeake 16091



DETAIL FOR STRUCTURE GUARD RAIL ANCHORAGE, TYPE A (MOD)

For details of anchorage attachment and special end shoe, see sheet #19

Notes:

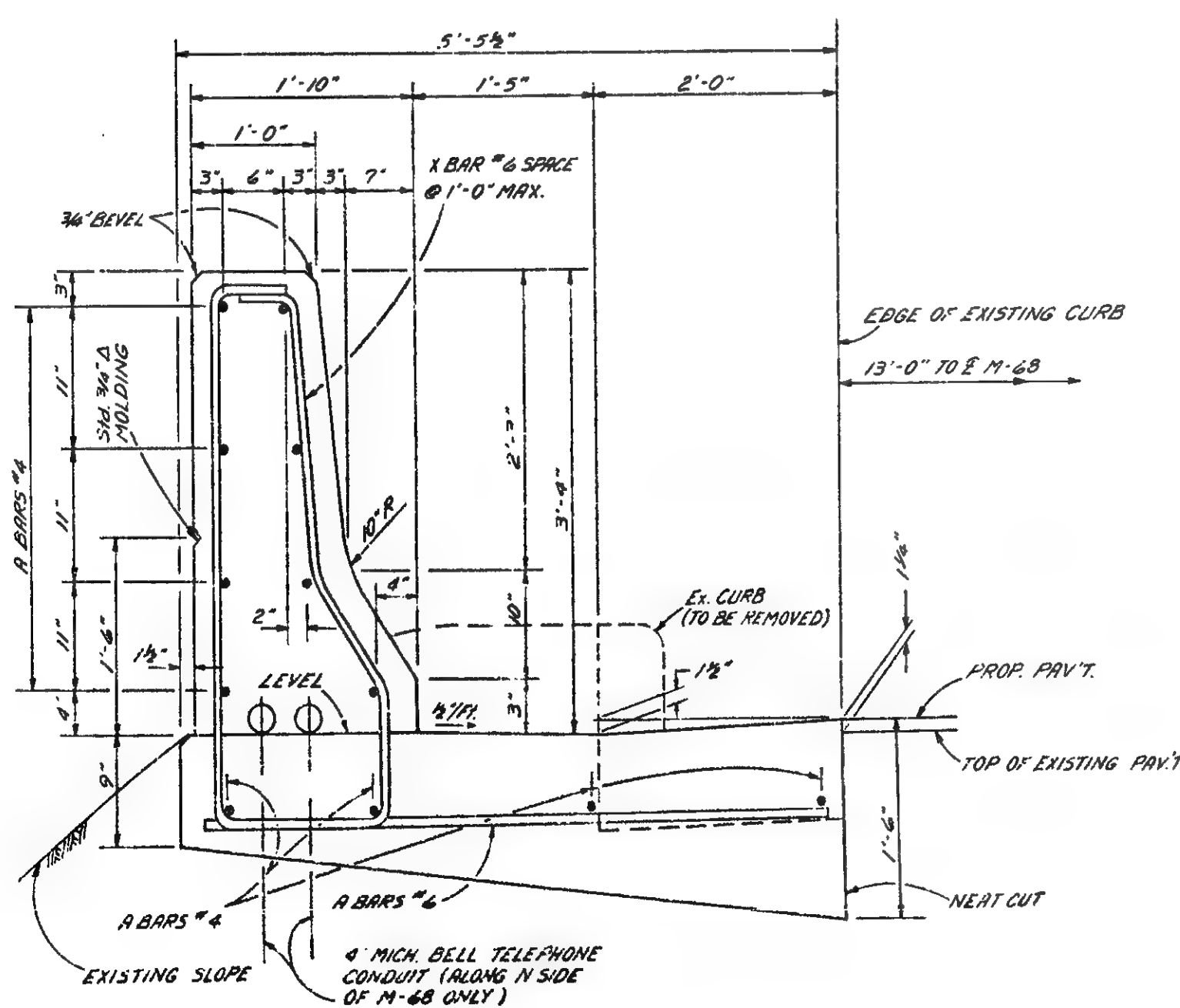
All bends in Reinforcing Steel to be made about a pin of the minimum diameter allowed by the Standard Specifications.

Tolerances in cutting and bending bars are as established in Manual of Standard Practice of the Concrete Reinforcing Steel Institute and Detailing Manual of the American Concrete Institute.

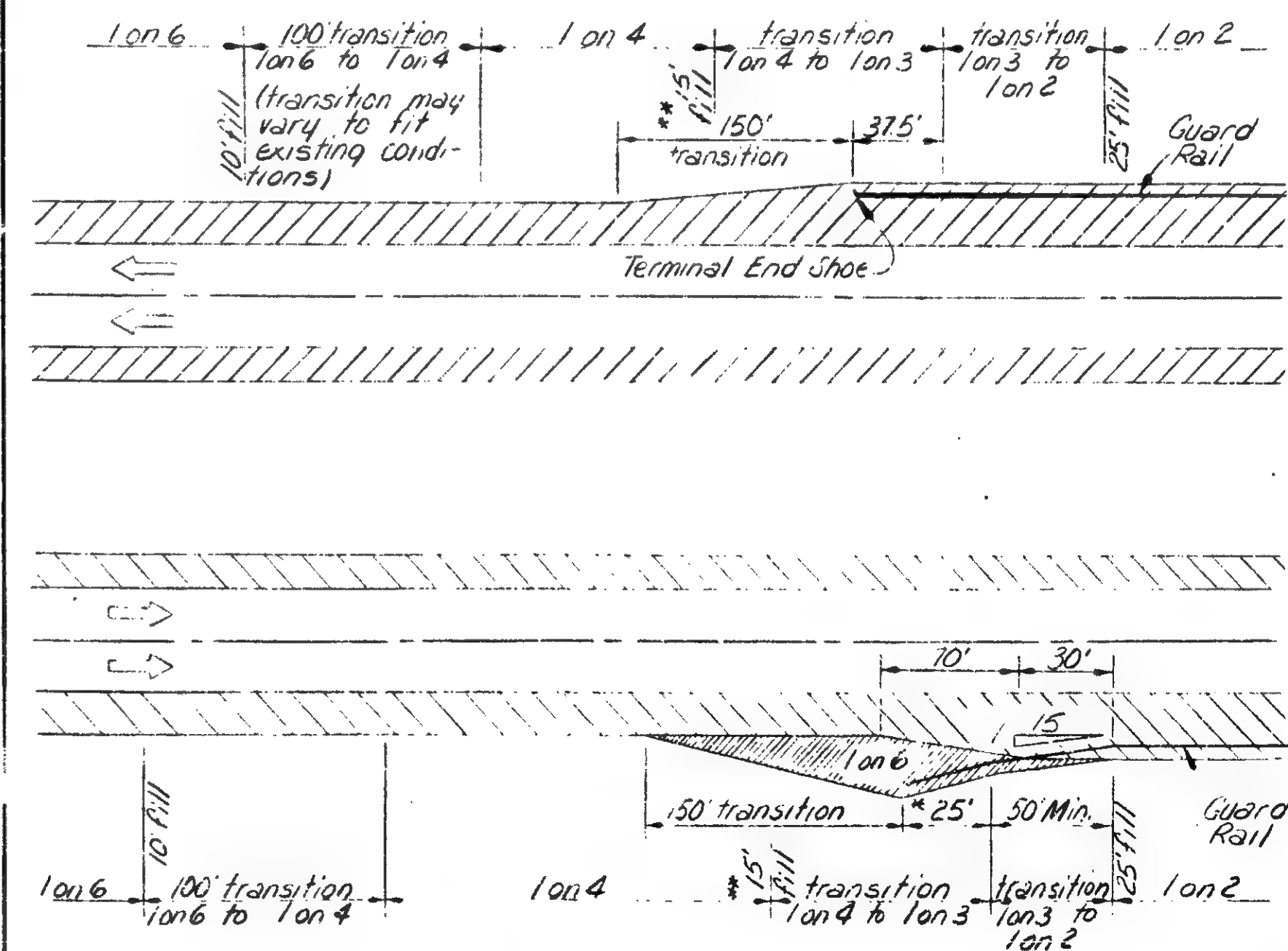
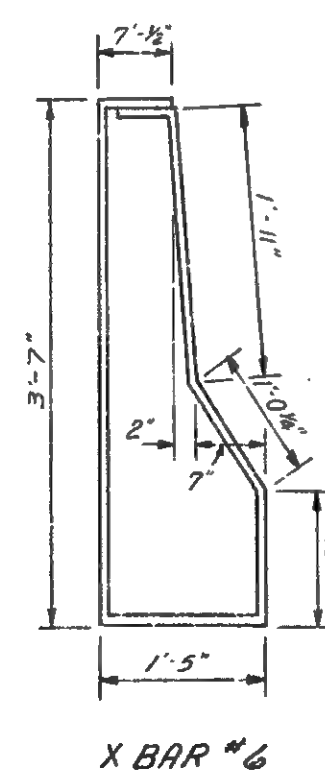
For Bevel & Molding details see Bridge Plans Steel Reinforcement for Concrete Barrier-Special shall conform to Section 8.05.03 Bar Reinforcement for Structures of Standard Specifications for Highway Construction.

4" Ø Telephone Ducts and Expansion Couplings will be furnished by Michigan Bell Telephone Co. and installed by the contractor.

The Michigan Bell Cable in the shoulder will be temporarily relocated by others prior to this contract.

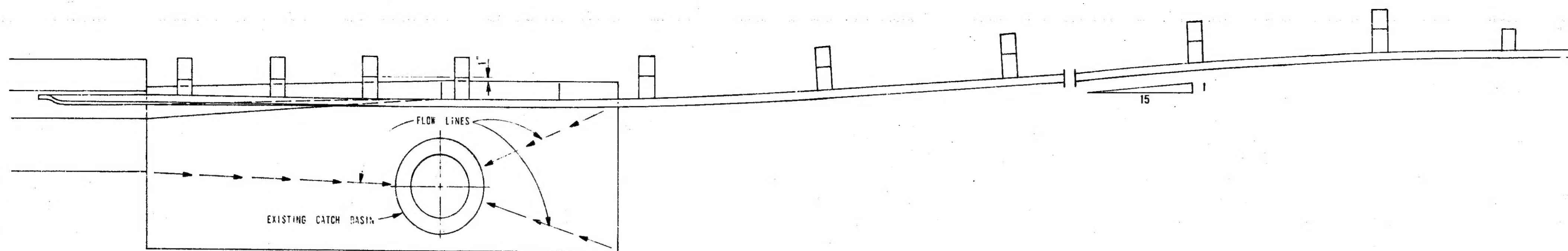


CONCRETE BARRIER - SPECIAL  
To be used between 5011502 of 16091



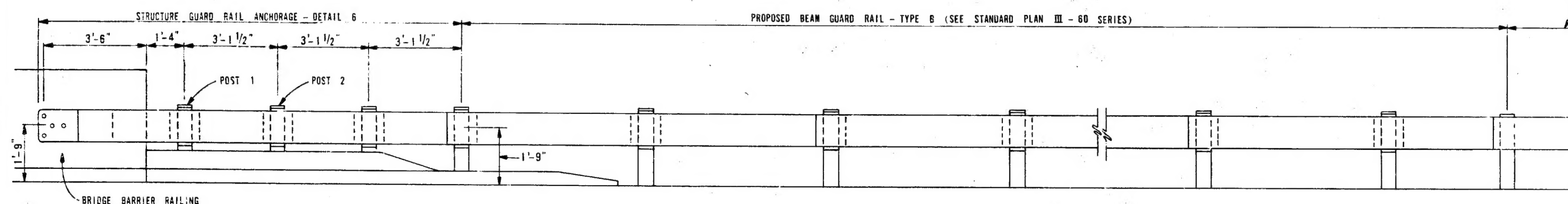
SKETCH FOR GUARD RAIL EMBANKMENT TRANSITIONS



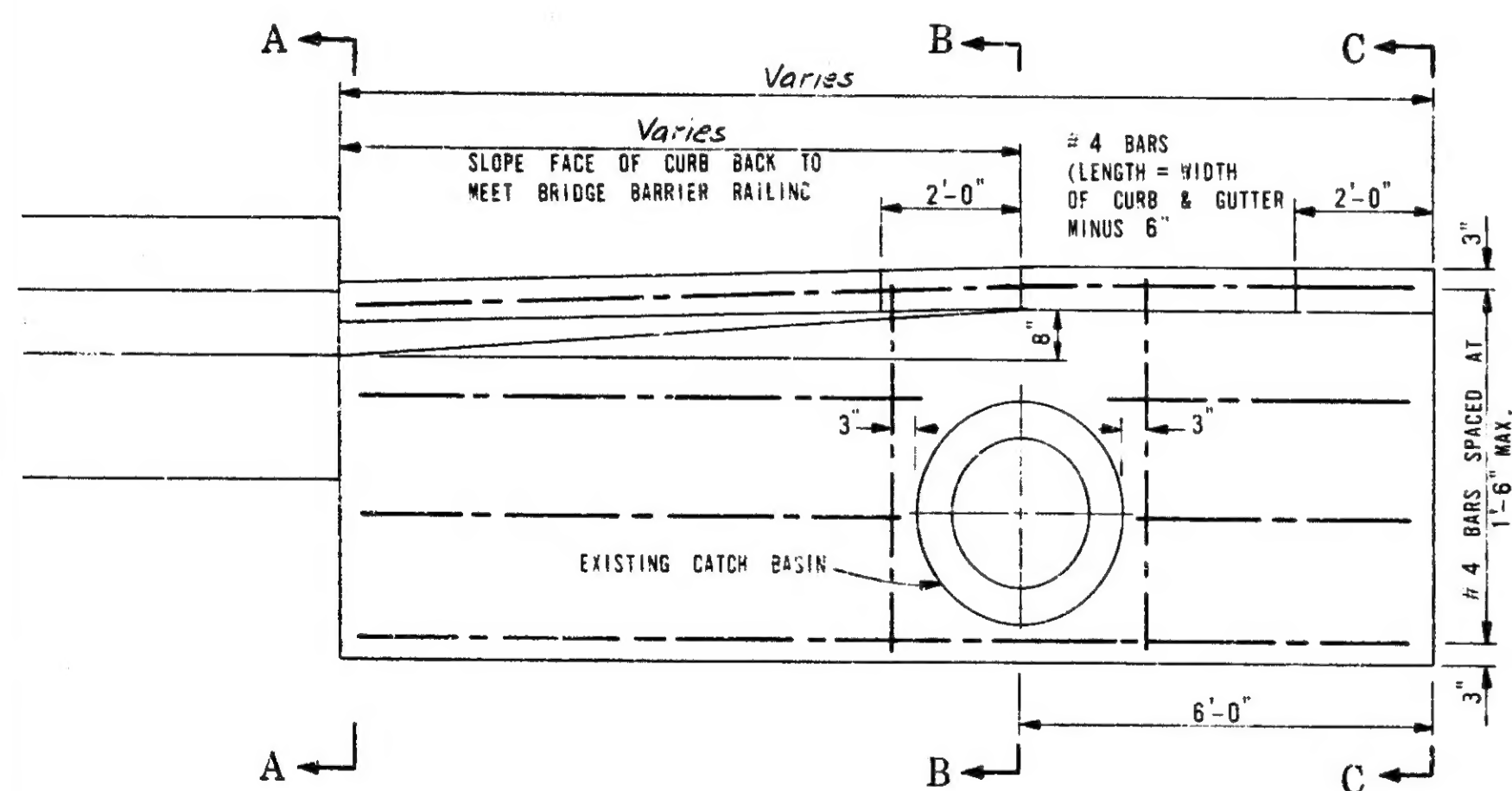


PLAN SHOWING STRUCTURE ANCHORAGE & LOCATION OF BEAM GUARD RAIL

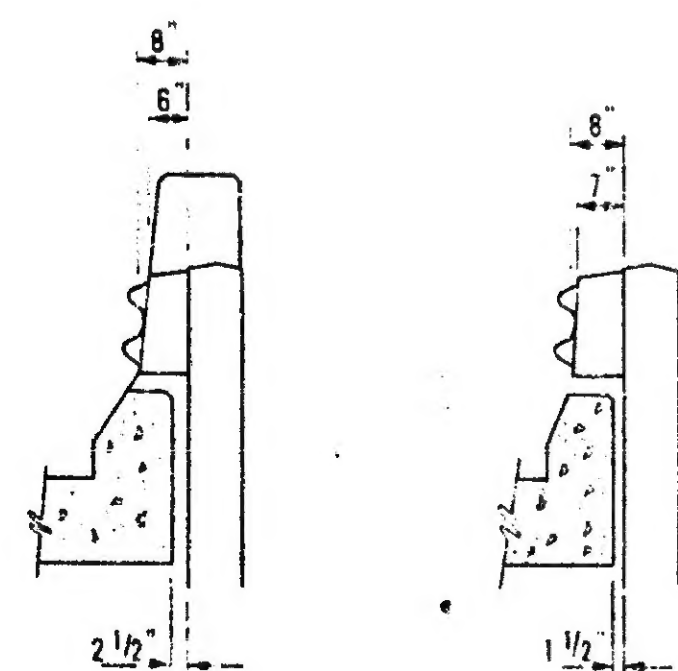
ATTACH TO EXISTING GUARD RAIL OR  
USE GUARD RAIL ENDING WITH CABLE  
ANCHORAGE. STANDARD PLAN III - 58 SERIES.



ELEVATION

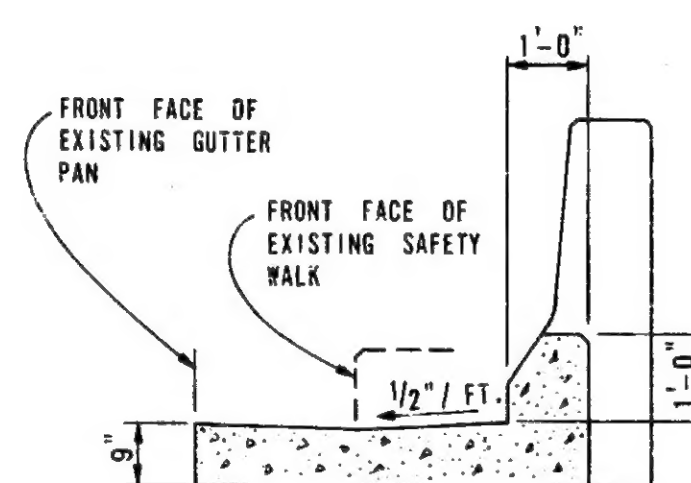


PLAN SHOWING PROPOSED BRIDGE APPROACH  
CURB & GUTTER USING EXISTING CATCH BASIN

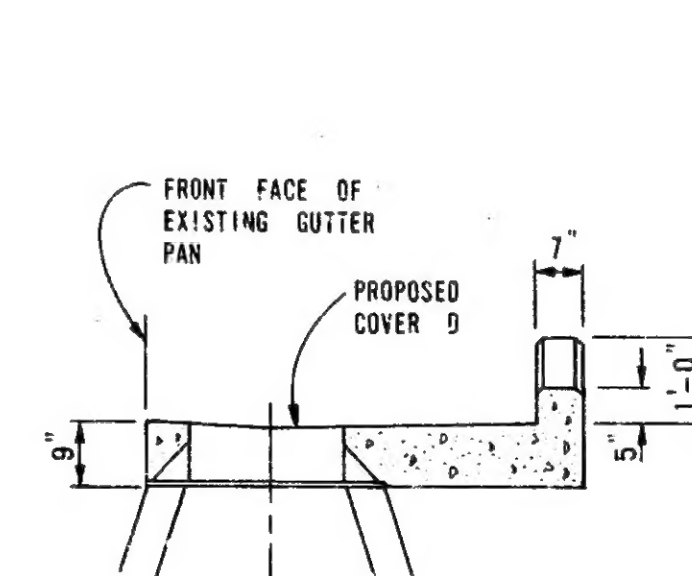


SECTION AT  
POST 1

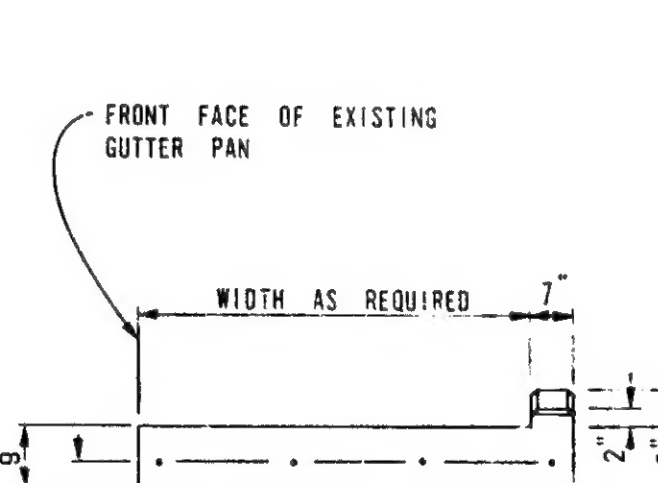
SECTION AT  
POST 2



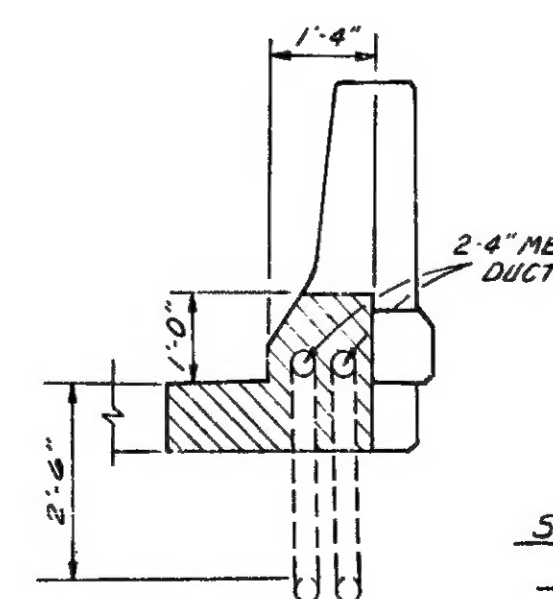
SECTION A-A



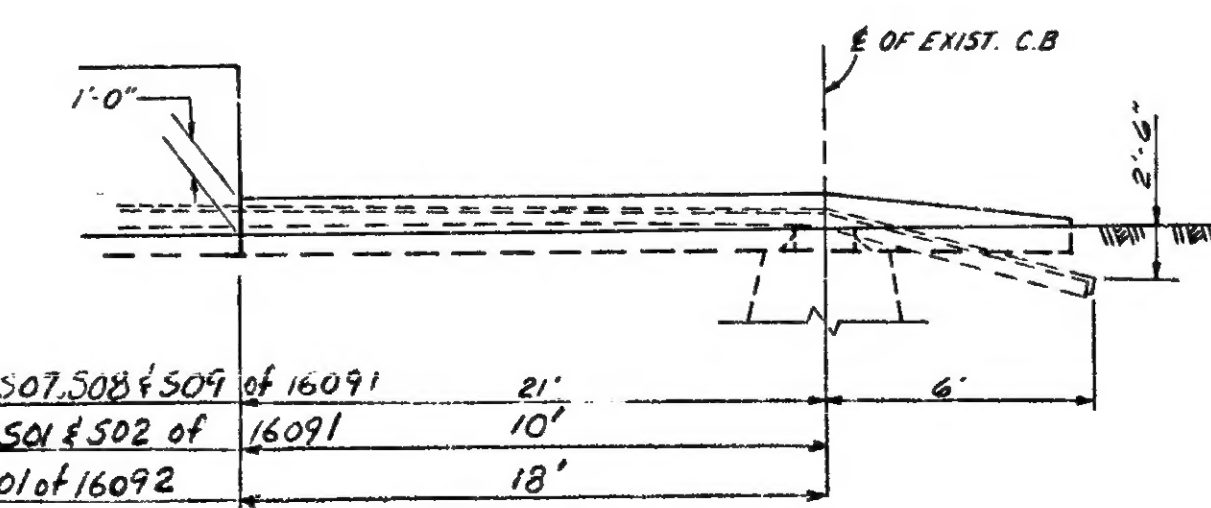
SECTION B-B



SECTION C-C



SECTION THRU BRIDGE APPROACH  
CURB & GUTTER - CONDUIT TYPE



ELEVATION OF BRIDGE APPROACH  
CURB & GUTTER - CONDUIT TYPE

NOTES:

THIS SPECIAL DETAIL IS INTENDED FOR USE IN SAFETY UP-DATING OF EXISTING GUARD RAIL AND STRUCTURE RAILINGS. FOR NEW CONSTRUCTION, AND DETAILS OF GUARD RAIL HARDWARE, SEE STANDARD PLANS.

ATTACH SPECIAL END SHOE TO BRIDGE BARRIER WITH 1/8"  $\phi$  HIGH STRENGTH BOLTS MEETING REQUIREMENTS OF ASTM A-325.

SPECIAL END SHOE WILL BE SAME MATERIAL AS ADJACENT RUN OF GUARD RAIL, EXCEPT THAT IT SHALL NOT BE LIGHTER THAN 10 GAGE.

STANDARD SPLICE BOLTS SHALL BE USED WHEN SPLICING SPECIAL END SHOE TO BEAM ELEMENT. THE NUT SHALL BE INSTALLED FINGER-TIGHT, FOLLOWED BY UPSETTING OF THE FIRST THREAD ON THE OUTSIDE OF THE SPLICE BOLT NUT WITH A CENTER PUNCH OR COLD CHISEL SO IT WILL NOT LOOSEN.

SECTIONS OF BEAM ELEMENT REQUIRED TO BE TWISTED FOR USE IN ANCHORAGE SHALL BE FIELD BENT.

NUTS, BOLTS AND WASHERS SHALL BE GALVANIZED OR CORROSION RESISTANT STEEL IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS.

BEAM ELEMENTS SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC.

CONNECT STRUCTURE ANCHORAGE TO APPROACH GUARD RAIL WITH A GRADUAL 1 ON 15 LATERAL SHIFT.

STATE OF MICHIGAN  
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION  
SPECIAL DETAIL FOR

STRUCTURE ANCHORAGE TO  
BRIDGE BARRIER RAILING

APPROVALS

CHECKED	ENGINEER - ROAD DESIGN	DATE
CHECKED	ENGINEER - BRIDGE DESIGN	DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF DESIGN	DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF TRAFFIC AND SAFETY	DATE
RECOMMENDED FOR APPROVAL	ENGINEER OF CONSTRUCTION	DATE

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION  
JOHN P. WOODFORD - DIRECTOR

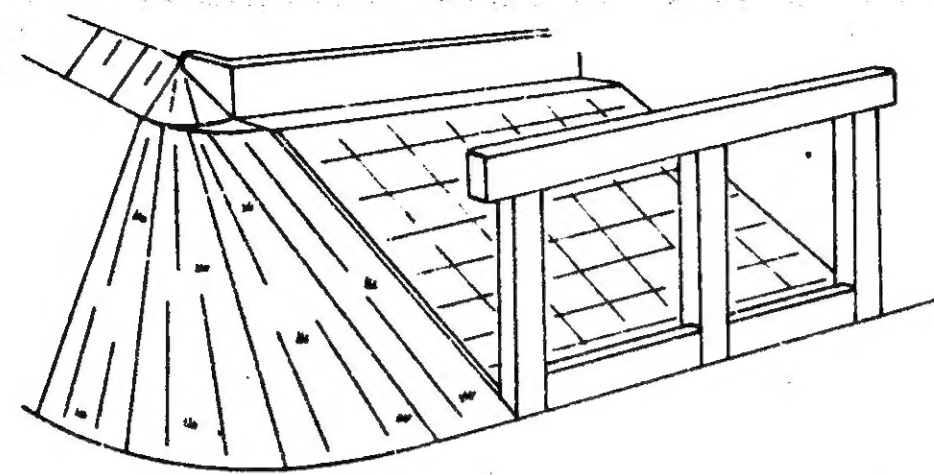
BY \_\_\_\_\_ DEPUTY DIRECTOR - HIGHWAYS \_\_\_\_\_ DATE \_\_\_\_\_

DRAWN BY H.A.W.	CHECKED BY V.R.	REVISED BY	2-16-78
PREPARED BY DESIGN DIVISION	APPROVED F.H.W.A.	DATE	SPECIAL DETAIL 8

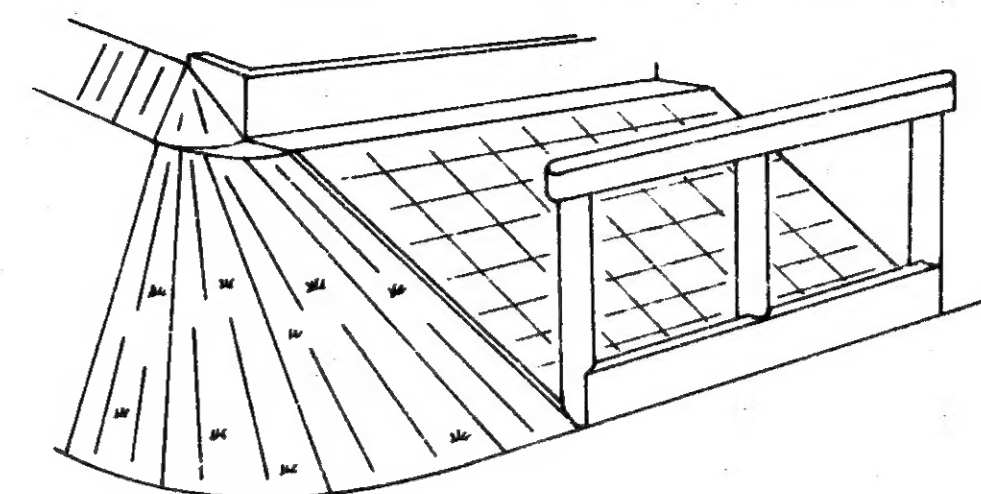
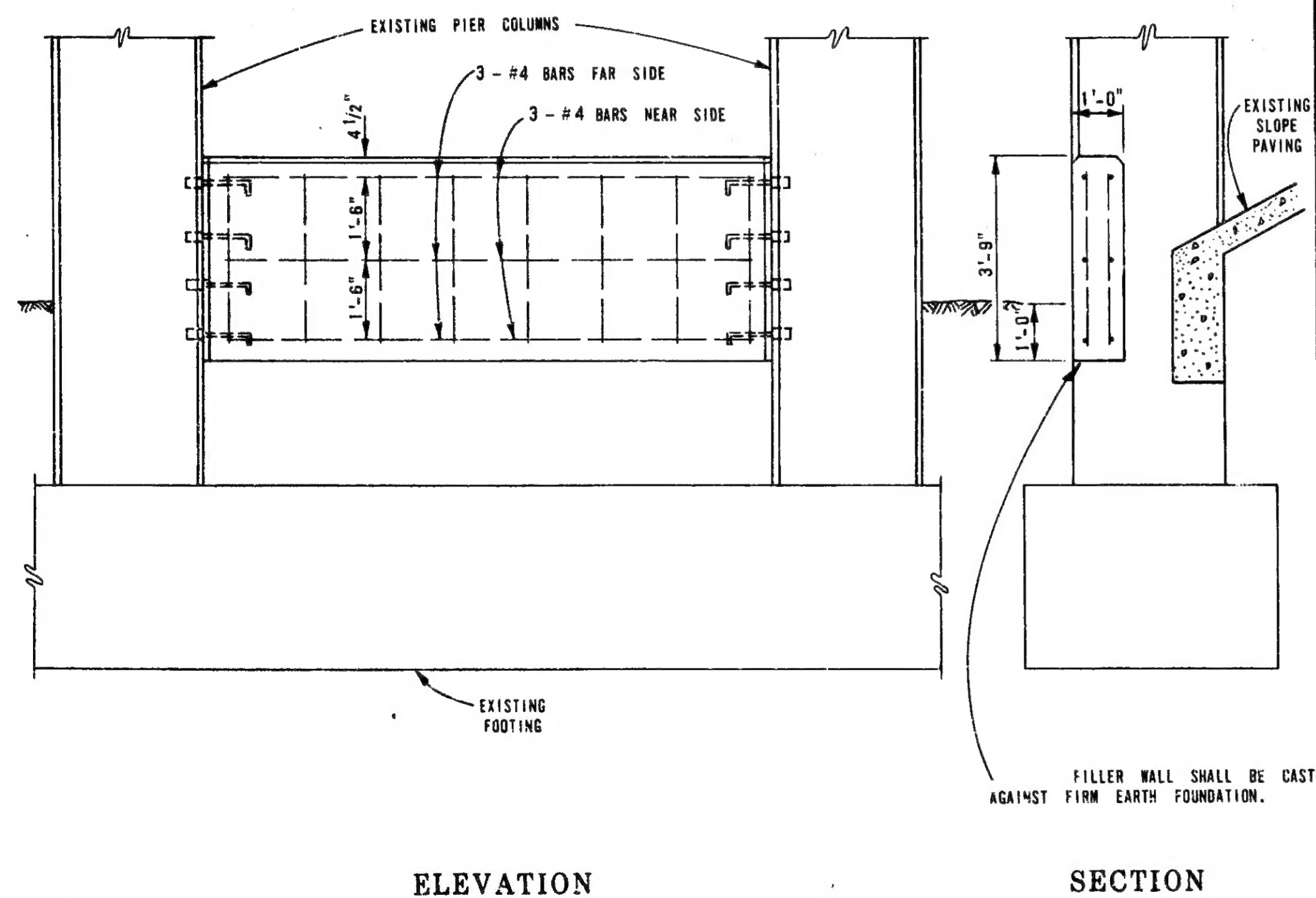
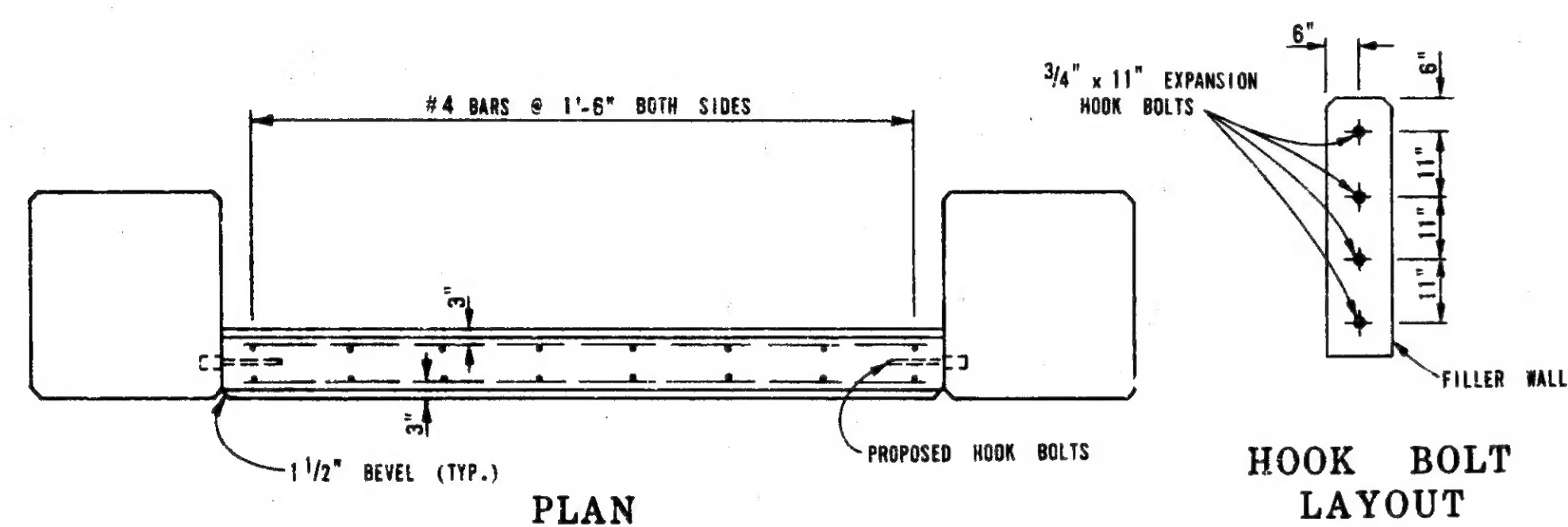
Is 16091 & 16092 - 14754A

SH. 17

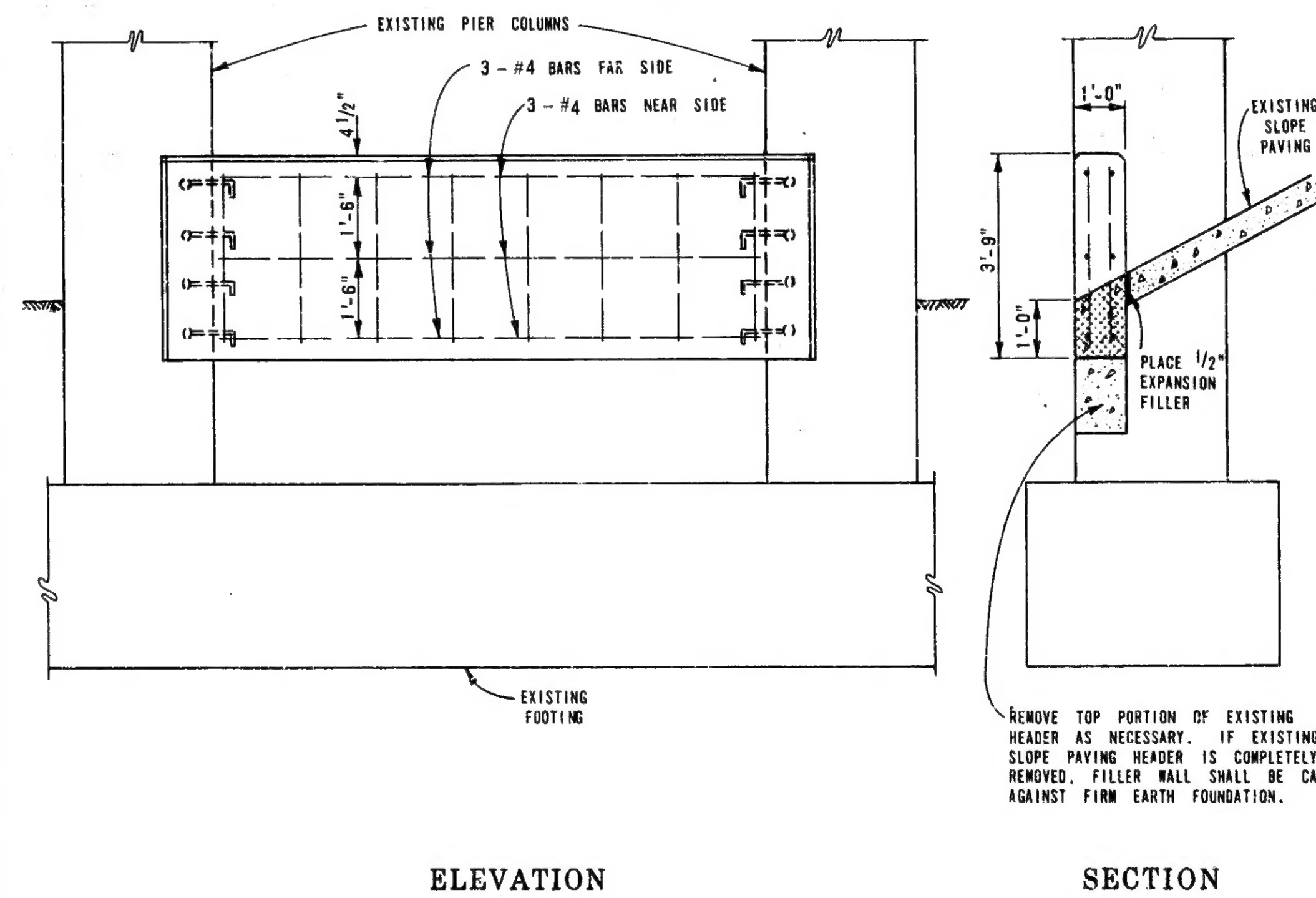
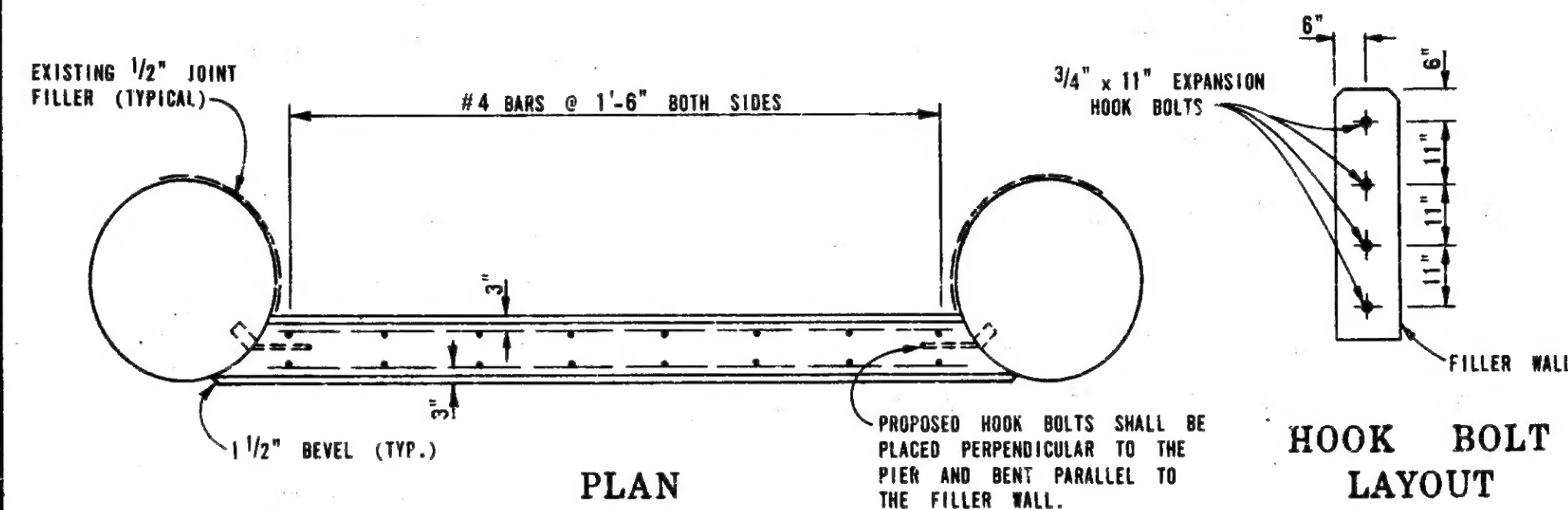




SKETCH OF FILLER WALLS AT SQUARE PIER COLUMNS



SKETCH OF FILLER WALLS AT ROUND PIER COLUMNS



NOTES:

GUARD RAIL ATTACHMENT TO FILLERWALLS SHALL BE AS SHOWN ON STANDARD PLAN III-67 SERIES AND SHEET NO. 1.

WHEN "NEW JERSEY" SHAPE BARRIER IS PLACED IN FRONT OF BRIDGE PIERS, SEE STANDARD PLAN II-49 SERIES.

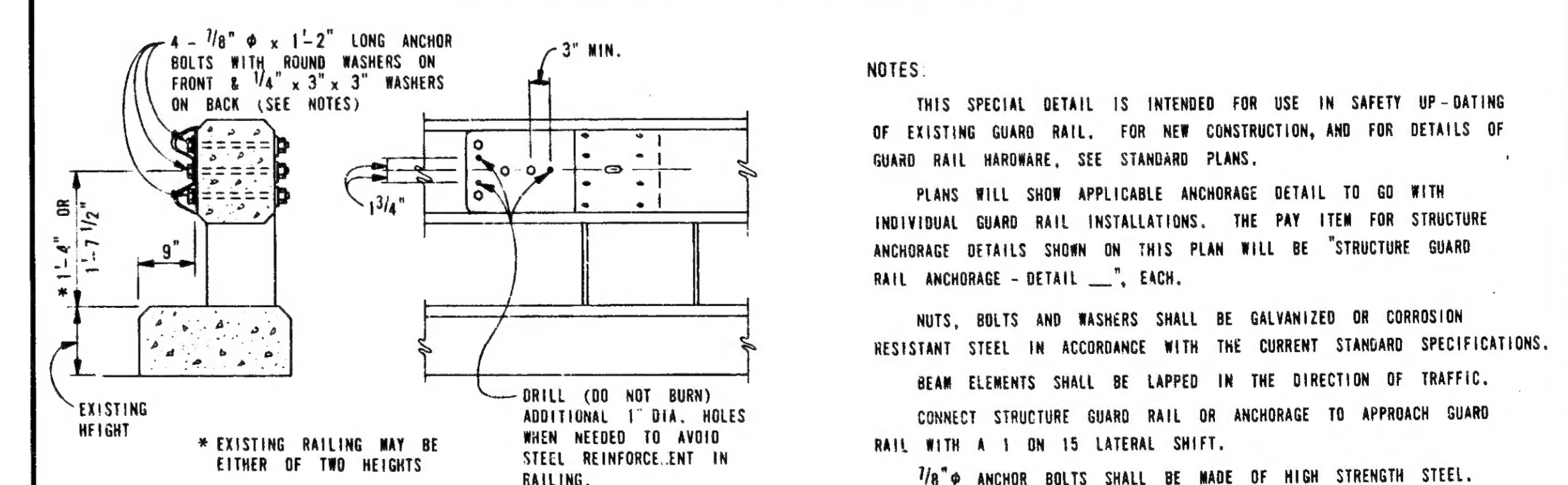
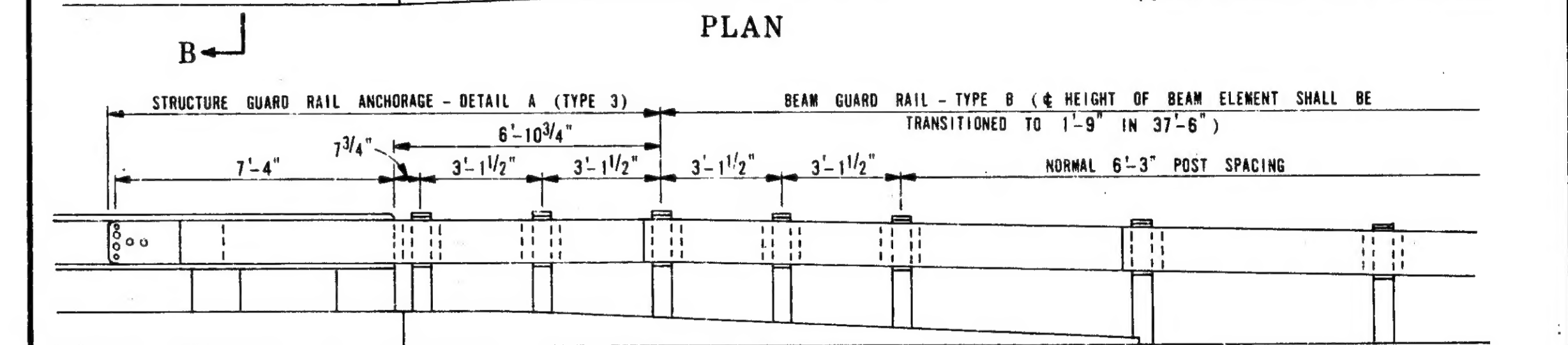
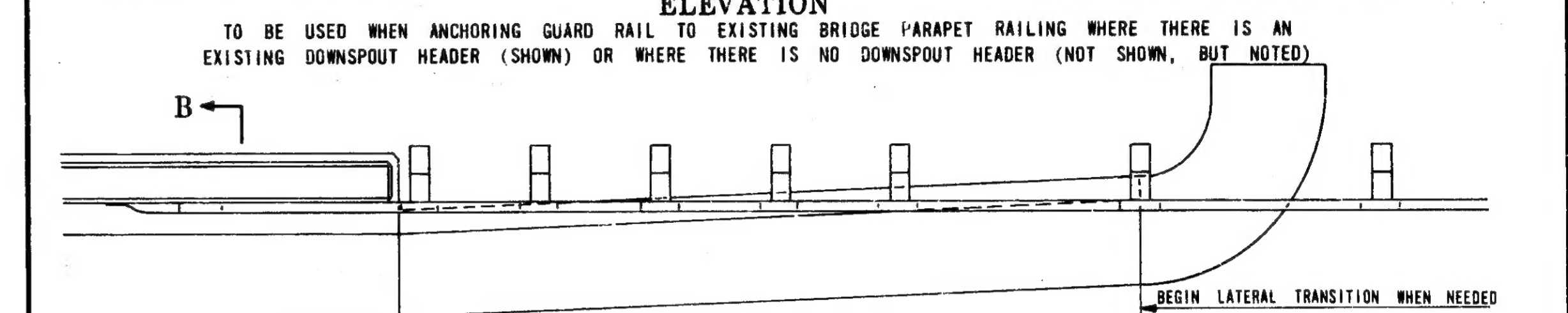
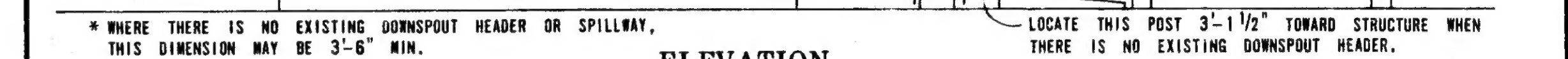
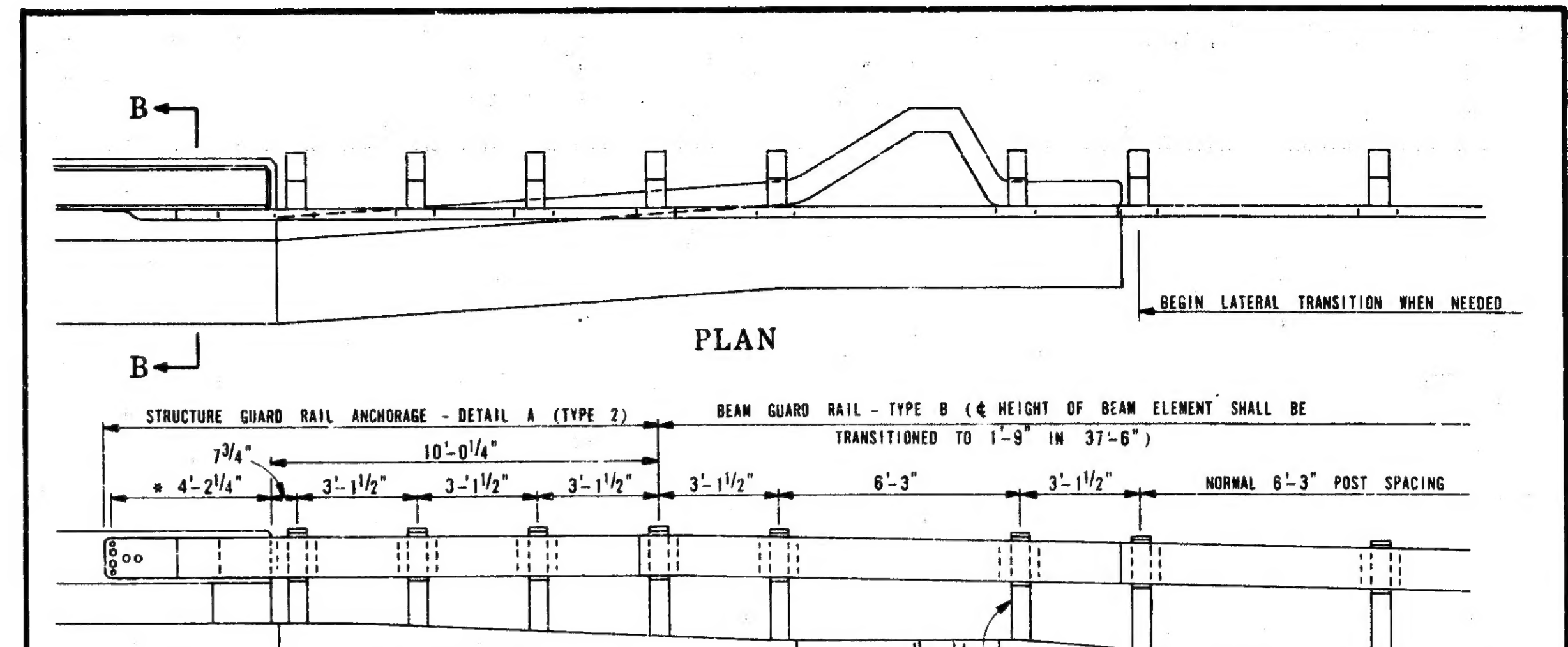
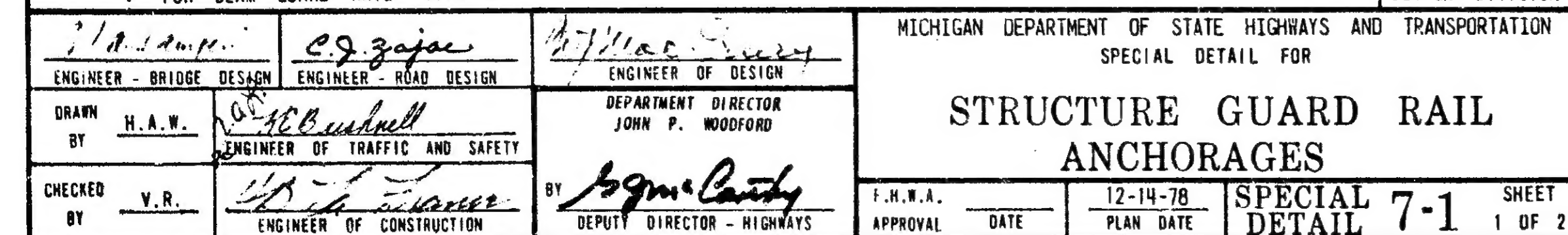
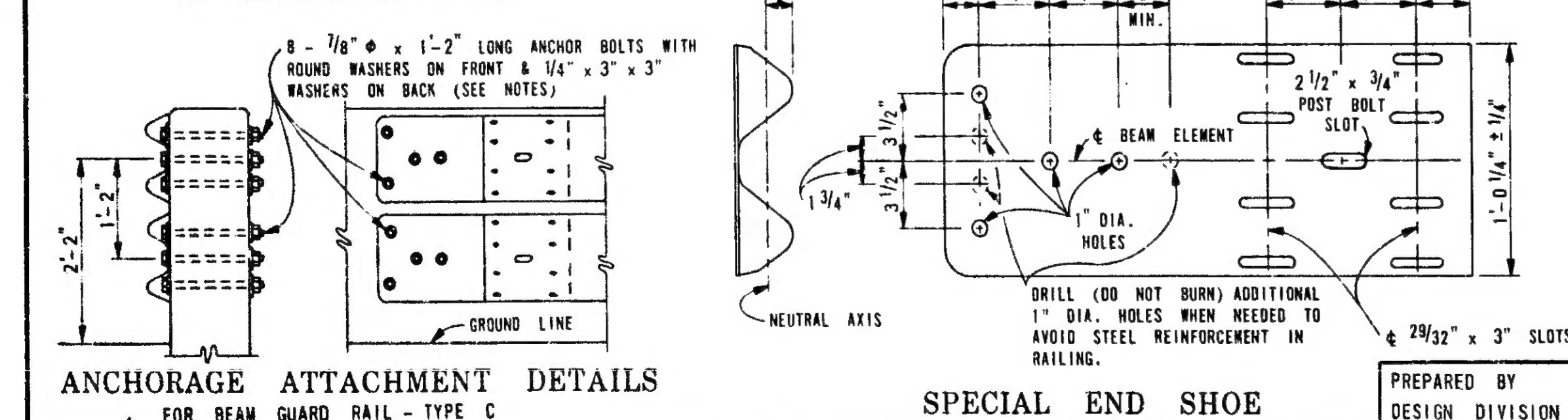
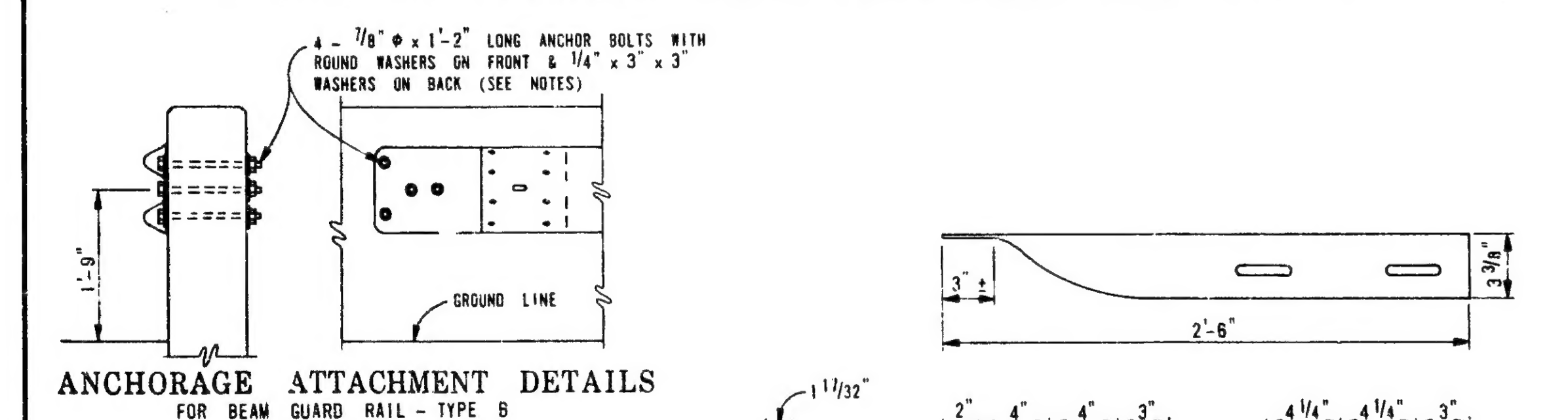
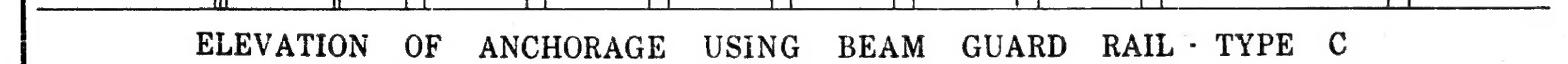
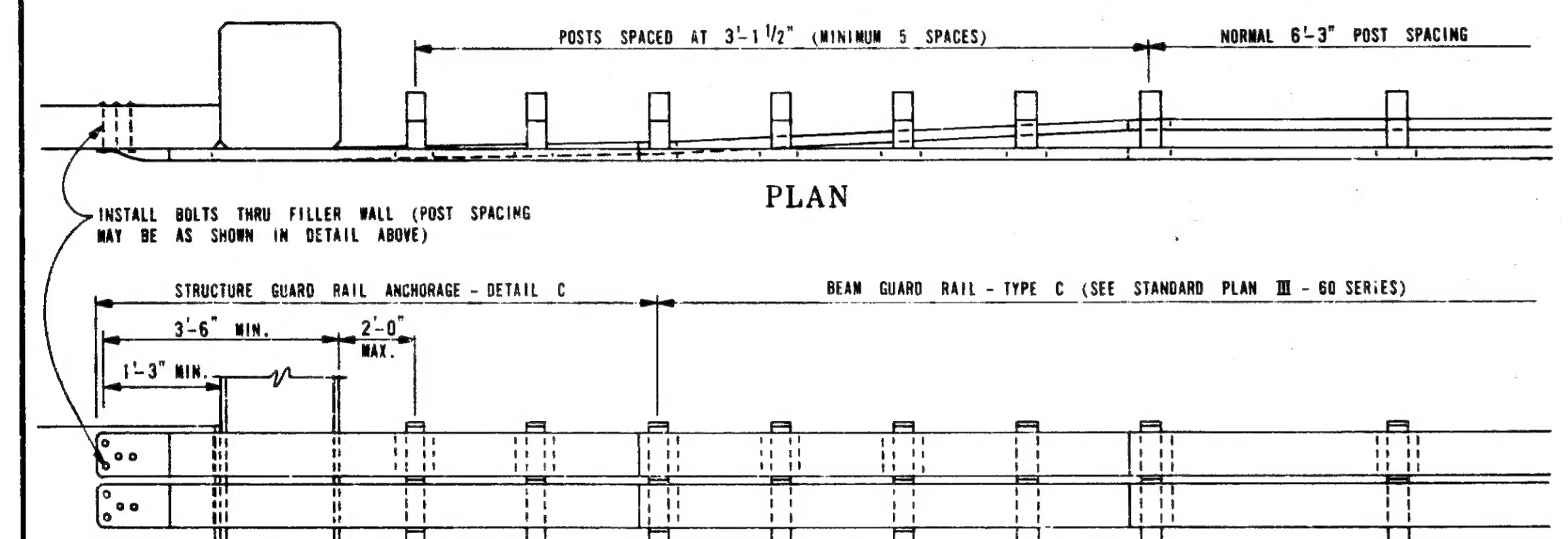
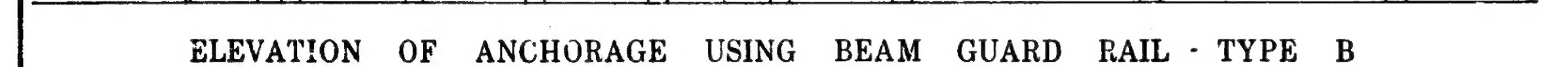
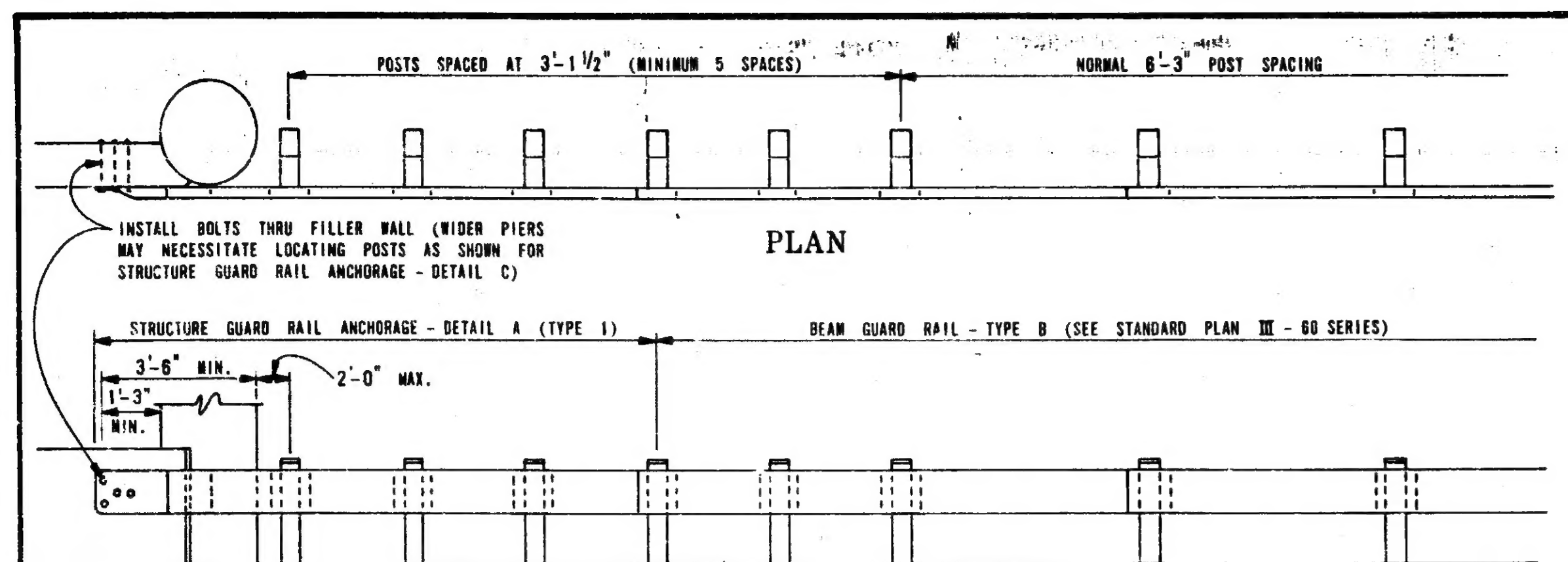
STATE OF MICHIGAN  
DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION  
SPECIAL DETAIL  
**FILLER WALLS BETWEEN  
EXISTING BRIDGE PIERS**

APPROVALS			
CHECKED	<i>C. J. Zupic</i>	12-1-76	DATE
	ENGINEER - ROAD DESIGN		
CHECKED	<i>W. L. K. Kasper</i>	12/2/76	DATE
	ENGINEER - BRIDGE DESIGN		
RECOMMENDED FOR APPROVAL	<i>W. L. K. Kasper</i>	12-2-76	DATE
	ENGINEER OF DESIGN		
RECOMMENDED FOR APPROVAL			DATE
	ENGINEER OF TRAFFIC AND SAFETY		
RECOMMENDED FOR APPROVAL			DATE
	ENGINEER OF CONSTRUCTION		

DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION  
JOHN P. WOODFORD - DIRECTOR

BY _____		DEPUTY DIRECTOR - HIGHWAYS		DATE _____	
DRAWN BY	H. A. W.	CHECKED BY	V. R.	REVISED BY	4-1-77
BY _____		BY _____		DATE _____	
PREPARED BY DESIGN DIVISION		APPROVED F. H. W. A.		DATE _____	





NOTES:

THIS SPECIAL DETAIL IS INTENDED FOR USE IN SAFETY UP-DATING  
OF EXISTING GUARD RAIL. FOR NEW CONSTRUCTION, AND FOR DETAILS OF  
GUARD RAIL HARDWARE. SEE STANDARD PLANS.

PLANS WILL SHOW APPLICABLE ANCHORAGE DETAIL TO GO WITH INDIVIDUAL GUARD RAIL INSTALLATIONS. THE PAY ITEM FOR STRUCTURE ANCHORAGE DETAILS SHOWN ON THIS PLAN WILL BE "STRUCTURE GUARD RAIL ANCHORAGE - DETAIL \_\_\_\_", EACH.

NUTS, BOLTS AND WASHERS SHALL BE GALVANIZED OR CORROSION RESISTANT STEEL IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS.

CONNECT STRUCTURE GUARD RAIL OR ANCHORAGE TO APPROACH GUARD RAIL WITH A 1 ON 15 LATERAL SHIFT.

7/8"  $\phi$  ANCHOR BOLTS SHALL BE MADE OF HIGH STRENGTH STEEL.

PREPARED BY  
DESIGN DIVISION

U.S. map ENGINEER - BRIDGE DESIGN		C. B. Jope ENGINEER - ROAD DESIGN		Not Made Every ENGINEER OF DESIGN		MICHIGAN DEPARTMENT OF STATE HIGHWAYS AND TRANSPORTATION SPECIAL DETAIL FOR				
DRAWN BY H. A. W.		J. E. Bushnell ENGINEER OF TRAFFIC AND SAFETY		DEPARTMENT DIRECTOR JOHN P. WOODFORD		STRUCTURE GUARD RAIL ANCHORAGES				
CHECKED BY V. R.		H. A. J. Jope ENGINEER OF CONSTRUCTION		BY J. G. M. Parry DEPUTY DIRECTOR - HIGHWAYS		F. H. W. A. APPROVAL DATE		12-14-78 PLAN DATE	SPECIAL DETAIL 7-1	SHEET 2 OF 2

Is 16091 & 16092 - 14754A

5ht 19



014754C

ROAD TOTAL

## SUMMARY OF QUANTITIES

ITEM DESCRIPTION	ITEM CODE	UNIT	PROJECT TOTAL	JOB SUBTOTAL	SHEET 002	SHEET 003	SHEET 004	SHEET 005	SHEET 006	SHEET 007	SHEET 008	SHEET 009	SHEET 010	SHEET 011	SHEET 012	SHEET 013	SHEET 014	SHEET 015	AS CONSTRUCTED TOTAL	ITEM DESCRIPTION	ITEM CODE	UNIT	AS CONSTRUCTED TOTAL
REMOVING CURB AND GUTTER	2070005	LFT	1178	1178		214	133	122		157	136		141	138				137	12370	REMOVING PAVEMENT MARKINGS	6310006	LFT	0.1
EARTH EXCAVATION	2080001	CYD	4985	4985				948						1197				2842	7218	TEMP PAVT MARKING 2' DASHED	6310007	STA	0.1
EMBANKMENT (CIP)	2080008	CYD	37631	37631		5048		12724						3551	436			15871	36854	TEMP PAVT MARKING SOLID	6310009	STA	0
MACHINE GRADING-MODIFIED	2087000	STA	41	41			8	4		2	4	2	6		8	4	2		5180	LIGHTED ARROW TYPE A FURNISHED	6310011	EACH	1.1
RAY OR STRAW BALES	2130009	EACH	100	100	100														0	LIGHTED ARROW TYPE A OPERATED	6310012	EACH	1.1
AGGREGATE BASE - BITUMINOUS (9" IN PLACE)	3010011	SYD	39	39															0	BARRICADE TYPE II LIGHTED FURN	6310021	EACH	16
FILLER WALL CONCRETE GRADE 35	5030008	CYD	51	51		10				3	4		4	4				14	512	BARRICADE TYPE II LIGHTED OPER	6310022	EACH	16
STEEL REINFORCEMENT	5030030	LBS	2659	2659		51													23240	SIGN TYPE II B TEMPORARY	6310036	SET	560.1
3/4" EXPANSION ANCHORED BOLTS	5030141	EACH	320	320		2659													3200	SIGN TYPE II B TEMPORARY	6310037	SET	0.1
BR APPR CURB AND GUTTER (MODIFIED)	5087000	LFT	568	568		320												35	6220	3" STEEL POST TEMPORARY	6310044	LFT	1046.1
BR APPR CURB AND GUTTER CONDUIT TYP	5087001	LFT	312	312		31	133	122		68	58		60	61					2910	MINOR TRAFFIC DEVICES	6310054	L SUM	1.0
12" CLASS B CULVERT (CONCRETE)	5110133	LFT	228	228		30				88	58		60	50				36	4220	FLAG CONTROL	6310055	L SUM	1.0
15" CLASS B CULVERT (CONCRETE)	5110134	LFT	54	54						12	6	12	48	36		19	36	24	420				
18" CLASS B CULVERT (CONCRETE)	5110135	LFT	216	216												12	42		1570				
24" CLASS B CULVERT (CONCRETE)	5110137	LFT	408	408												18	60	12	3810				
30" CLASS B CULVERT (CONCRETE)	5110139	LFT	156	156															250				
36" CLASS B CULVERT (CONCRETE)	5110140	LFT	300	300															3600				
48" CLASS B CULVERT (CONCRETE)	5110142	LFT	36	36															320				
CULVERT END SECTION ORATE	5111006	LBS	1151	1151															4980				
6" CULVERT END SECTIONS	5111020	EACH	4	4															4				
12" CULVERT END SECTIONS	5111021	EACH	28	28															14				
15" CULVERT END SECTIONS	5111022	EACH	8	8															8				
18" CULVERT END SECTIONS	5111023	EACH	14	14															11				
24" CULVERT END SECTIONS	5111025	EACH	39	39															26				
30" CULVERT END SECTIONS	5111027	EACH	11	11															5				
36" CULVERT END SECTIONS	5111028	EACH	11	11															9				
48" CULVERT END SECTIONS	5111030	EACH	3	3															3				
SALVAGED END SECTION																							
30" DIAMETER OR LESS	5111038	EACH	1	1															35				
DRAINAGE MARKER POST	5111051	EACH	75	75															17				
4" DIAMETER DRAINAGE STRUCTURE	5140030	EACH	10	10															12				
DRAINAGE STRUCTURE COVERS	5140042	LBS	13830	13830															14230				
ADJUSTING DRAINAGE STRUCTURE COVERS	5140045	EACH	14	14															27				
4 FT CATCH BASIN	5148000	EACH	10	10																			
COVER D	5148001	EACH	26	26																			
COVER E	5148002	EACH	10	10																			
EDGE DRAINS 6"	6020021	LFT	36	36																			
CONCRETE BARRIER-SPECIAL	6127000	LFT	118	118																			
GALVANIZED BEAM GUARD RAIL, TYPE B DETAIL 1	6130002	LFT	11478	11478																			
GALVANIZED STRUCTURE GUARD RAIL																							
ANCHORAGE, TYPE B	6130010	EACH	24	24																			
GALVANIZED CURVED BEAM GUARD RAIL, TYPE B DETAIL 1	6130019	LFT	413	413																			
BEAM GUARD RAIL, TYPE B DETAIL 1	6130031	LFT	7876	7876																			
STRUCTURE GUARD RAIL																							
ANCHORAGE, TYPE B	6130046	EACH	5	5																			
GUARD RAIL ANCHORAGE, CABLE	6130086	EACH	65	65																			
SALVAGED BEAM GUARD RAIL	6130073	LFT	25743	25743																			
REFLECTORIZED WASHERS	6130080	EACH	551	551																			
TERMINAL END SHOES	6130086	EACH	17	17																			
BUFFERED END	6130088	EACH	6	6																			
ONLY STR OD RAIL ANCH TYPE A MODIF	6137000	EA	8	8																			
STRUCT OD RAIL ANCH TYPE A MODIFIED	6137001	EA	11	11																			
TEMPORARY FENCE	6210004	LFT	200	200																			
MOBILIZATION	6230001	L SUM	1	1																			
CLASS B SOODING	6510002	SYD	5859	5859																			
WATER	6510003	UNIT	15	15																			
ROADSIDE SEEDING	6520001	LBS	1017	1017																			
CERIAL RYE SEEDING	6520003	LBS	730	730																			
CHEMICAL FERTILIZER NUTRIENT TOPSOIL SURFACE, 3"	6520004	LBS	2361	2361																			
MULCH	6540001	TON	37	37																			
ANCHORING MULCH	6540002	ACRE	12	12																			
ON THE JOB TRAINING	6920000	EACH	2	2																			
EXTRAS																							
12" CLASS B CULVERT (CONCRETE) SPECIAL	9007000	LFT																					
24" CLASS B CULVERT (CONCRETE) SPECIAL	9007001	LFT																					
48" CLASS B CULVERT (CONCRETE) SPECIAL	9007002	LFT																					
24" CULVERT END SECTIONS SPECIAL	9007003	EACH																					
36" CULVERT END SECTIONS SPECIAL	9007004	EACH																					
36" CULVERT END SECTIONS SPECIAL	9007005	EACH																					
48" CULVERT END SECTIONS SPECIAL	9007006	EACH																					
SIGN POST TEMP. SPECIAL	9007010	LFT																					
FLAG RIB-RSE	9007011	SYD																					

